Handbook
EPO

- Introduction & overview -
- Installation -
- (First) use -
- Configuration -
- Administration -

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1 Introduction

1.1 General description

EPO-Framework is intelligent software which monitors vital processes and warns at a very early stage for deviations of the Service Level thresholds.

EPO is the suite of all business solutions which C-it, the Early Warning Company have produced the previous years as tailor-made jobs. The red wire of all those business solutions has become the SLA-framework EPO-Elements.

Direct use

EPO-Elements is ready to use (out-of-the-box) still on the day of the installation for starting with:

- The helpdesk for supporting customer communication included with procedure monitoring
- and/or the guarding of servers with basic information as CPU, memory, disk space, services and eventlogs.
- and/or room monitoring (by means of the EPO-room monitor with e-Nose)

Configuration

EPO-Elements can be adapted simply by means of configuration for:

- applications or network services (contracts) to monitor
- to monitor for example VOIP-chains
- or monitor servers outside your own network (for example as service to customers)
- to monitor financial figures

Scripting

By means of configuration and small tailor-made scripts EPO Elements can be used:

- for the planning of guarding of vital (services) chains
- directly to connect on individual communication needs
- to escalate by means of e-mail, sms, semafone,...
- to be connected on existing technical guarding resources
- enrich technical monitoring to couple it to the experience feeling of the users
- report templates to offer to own report generator
- to monitor agentless vital company processes

1.2 Aim of the handbook EPO

The aim of this user-manual is offer aid as sort 1e-line book of references.
Thus are successively described:

1) **The installation** (of the server, client and probes)
2) **The first use** (how the helpdesk, chain monitoring or remote monitoring can be arranged)
3) **EPO-functionality** (enumerating descriptions of all EPO-functions)
4) **Configuration** (adapt settings of several EPO-items, such as: server, client and probes)
5) **Administration** (backup, restore and problem solution)

1.3 Additional information

On C-it-website and EPO-Forum you can find additional information on EPO.

1.3.1 EPO-Website

The most recent version of the product leaflets are available at the C-it-website www.C-it.nl.
The Internet site contains among other things:

- Leaflets with general information
- Product fact sheets with more technical specifications

1.3.2 EPO-Forum

The most recent version of the software is available on the EPO Elements Forum www.epo-elements.nl.
The EPO-forum contains (among other things):

1. Answers on frequently asked questions
2. A probe library with examples.
3. The most recent version of this handbook

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2 EPO - Business Monitoring

2.1 General

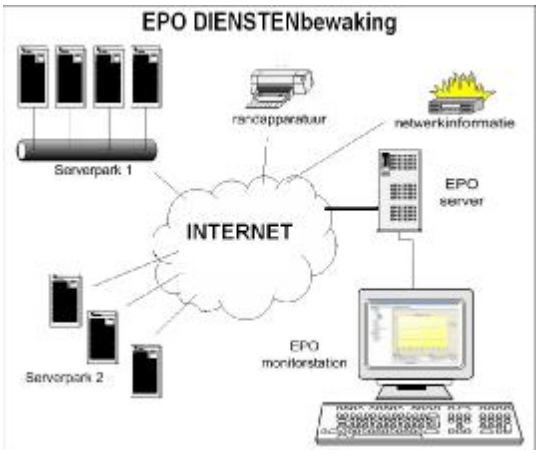
EPO have been built from the vision that monitoring from the interests of the organization will be more effective than simply monitor all the technical system events.

EPO have been also developed to offer “The strength of open source” but with the professionalism of Enterprise management…

Therefore EPO contains the functionality which is necessary for:

- Business Monitoring
- Chain Monitoring
- Remote Monitoring
- Room Monitoring
- Early Financial Warning
- Helpdesk/CustomerCare including ITIL-process monitoring

Or every combination of the above mentioned functionalities.



EPO has been developed for managers and ICT experts:

- General and financial directors who want to monitor their appointments with their customers.
- Process managers and controllers who want to monitor their internal processes.
- Service proposers who want to supply remote services.
- Central systems or building administrators who have ongoing sensual guarding necessary for (technical) spaces where they daily does not come anymore.
- Financial controllers who want real-time monitoring of the monthly key figures and who want to be able to react also real-time.
- Helpdesk employees and process managers who want to - on the base of Keep-IT-Simple - organize their customer contacts and get their helpdesk processes under control and keep it that way.

2.2 Method

Common used management software often gives an excess of data concerning systems and network components. Whereas only a small part of it is really relevant. Moreover this superabundance takes away the visibility on what is really important. For this reason the Early Warning Company states that successful monitoring does not start at technique, but starts from the view of the company processes and the thresholds defined by the management. That is how desired performances (service Levels) can be made measurable. EPO have been developed to measure only the important components that really matter for your organization.
EPO focuses on the company processes. Thus EPO can verify continuously if orders are being rapidly enough processed or that computer systems are available within agreed uptimes. For the industry EPO can check production processes. In combination with Check-it's eNose EPO can monitor exposures of gases. Thus EPO cooperates closely with every system that can collect and pass on information. Moreover there are plug-ins for functions such as time recording, helpdesk recording, monitoring of several processes and much more.

2.3 Architecture

EPO exists of several components which are in contact with each other. Mentioned below reflects the base architecture of EPO.

The picture above shows that all communication between the EPOServer and the probes goes by means of the transport layer.

The picture below shows the communication between the different components of EPO.

2.4 Services

An EPO-Server typically contains the following components:

1	EPO Diaspora		Started	Automatic
2	EPO Mail Gateway	Allows EPO components to send e-mail through a SMTP mail server	Started	Automatic
3	EPO Message Transport	Regulates all communication between the EPO components	Started	Automatic
4	EPO Probe	Performs the monitoring and data gathering operations for EPO	Started	Automatic
5	EPO Server	EPO Server stores data and provides the interface for the business clients	Started	Automatic
6	EPO SMS Gateway	Allows EPO components to send SMS-text messages	Started	Automatic

A machine installed with only the EPO-Probes contains the following components:

1	EPO Diaspora		Started	Automatic
3	EPO Message Transport	Regulates all communication between the EPO components	Started	Automatic
4	EPO Probe	Performs the monitoring and data gathering operations for EPO	Started	Automatic

A Desktop with the EPO GUI will not contain any service components.

A short description of the services:

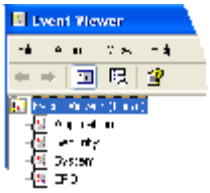
1. EPO Diaspora (optional for server and probe installation)
   The software distribution layer. With EPO Diaspora you can update (already existing!)

EPO probed machines.
Distributed software updates travel through the EPO message transport layer.

2. EPO Mail Gateway (optional for server installation)
   With this option it is possible to send email by a relaying mail server
3. EPO Message Transport
   Forms the transport layer between agent and database. Remote probes (agents) communicate with the local EPO message transport layer, which ensures the expedition of information to the database. The communication goes by means of a Postbox mechanism.
   At down the messages are stored in the local postbox of the probe until information can be forwarded (*store and forward*).
4. EPO Probe (optional for server installation)
   Obtains basic Windows information (CPU, diskspace, services) from the operating system and offers this to the transport layer (message service). Can be configured to retrieve additional information such as snmp-information, scrpts, sql statements, windows performance counters, ping values, ...
   At down: no information is gathered until service is started. Already existing probes will show blue in the EPO Business tree indicating the state “Unknown”.
5. EPO Server
   Ensures the communication with EPO-clients (EPOgui.exe). Ensures the processing of the data offered by the probes. Contains also the escalation manager functionality.
   At down: EPO-Clients cannot start because they can make no connection with the database. The probes will continue with their measurements. Measurements send by the probes by means of the epo message transport layer will be stored locally on the server. When the epo server service is started it will process the measurements retroactive.
6. EPO SMS Gateway (optional for server installation)
   With this option it is possible to send SMS-messages by gsm-modem or room monitoring unit (which has a local GSM-modem included).

2.5 Logging

The EPO-services log to the Windows Event Viewer (e.g. windows \ start \ run “eventvwr.exe”)



More detailed log information (informationals and debug messages) can be found under:

- ...\ Program files\ the Early Warning Company \ EPO \ Logs

Logs will be saved according the round robin method in default 10 files per component (server, transport layer and probe). Look for the latest datetime stamp to find the newest log.

2.6 Data transport (administration of the Postboxes)

Agents, or probes as we call them, (ntlog, probe and scheduled scripts) communicate their results by means of messages. These messages are forwarded by means of store-and-

foreward-mechanisme called the epo transport layer. When the network connection is temporarily down or epo services are not running messages are kept in local Postboxes.

To show the content of the local EPO-Postboxes on an EPO probed computer:
(directory... \ EPO \ tools \): “EPOMsgcmd.exe list”

Other commands will show when just starting epomsgcmd.exe with no parameters:

```
EPO Message Command Tool version 5.0 revision 1745
Copyright (c) 2002-2006 C-it

Usage:
  EPOMsgCmd [<options>] [-xsl <file>] locate [xml]
  EPOMsgCmd [<options>] [-xsl <file>] debug [html]
  EPOMsgCmd [<options>] [-xsl <file>] list [xml]
  EPOMsgCmd [<options>] [-xsl <file>] extract <postboxname>
  EPOMsgCmd [<options>] [-xsl <file>] extractall <postboxname>
  EPOMsgCmd [<options>] store [<postboxname>]
  EPOMsgCmd [<options>] storelist <filename> [<postboxname>]
  EPOMsgCmd [<options>] flush! [/Y] [<postboxname>]
  EPOMsgCmd [<options>] flushall! [/Y]
  EPOMsgCmd [<options>] registerresolve <resolvename> <postboxname>
  EPOMsgCmd [<options>] info [routes]
  EPOMsgCmd [<options>] setnetworkkey
  EPOMsgCmd [<options>] createnetworkkeyfile <filename>
  EPOMsgCmd roundtriptest <target> [Alarm|High|Normal|Low] [<nr tests>]

Options:
  -s <server>[:<port>[#<sourceport>]] to specify a server/port to connect to.
  -k <hex-key>|none                   sets the connection encryption key.
  -kp <passphrase>                    sets the connection encryption key.
  -kf <file>                        sets the connection encryption key.
Default connection is: bin://127.0.0.1:7472
Encryption default setting is disabled
```

NB this command can also be used to test the (epo) connection by asking the postboxes of a remote epo probed machine:

E.g.: epomsgcmd –s <ipadres of remote epo probed server> list

2.7 EPO internet client

THE EPO Windows client can be used from each network that has connection to the network with the EPO-server.
For example by means of the Internet, VPN (or other closed networks).

2.8 Probes (agents)

EPO has the following standard probes (agent):

- Windows server (CPU, memory: (physical and logically), disk space, EventLogs, services and processes)
- SNMP (ip-adres & ObjectID)
- Windows Performance Counters
- Ping (availability and response time)
- Interface (commandscripts, perl, sqlcommands, .net,...)
- HTTP (including automated substitution of parameters and variables)
- ITI proces monitoring (service levels for open incidents, problems, ...)

Only valid for EPO room monitoring:

- e-Nose (fragrance of burned electronics, Scorching, Volatile Organic Compounds cigarette smoke, etc.);

- Temperature; air humidity; leak water (airco, roof, water piping,...); Voltage level (for or after the UPS);
- Optional devices: webcam, door contact, fingerprint unit.

2.8.1 Agentless

By EPO monitored components (servers, applications,...) can also be monitored agentless (this means no separate agent/probe on the monitored server itself). As from the EPO-server (or a random other EPO probed machine) scripts can be scheduled (see the probe library for examples) which monitor the components on distance.

2.9 System management/helpdesk CustomerCare

- Registration of incidents, modification requests, problems, tasks, activities and other customer reports.
- Incident monitoring on Service-Level-Agreements.
- Automated import of your customer database (no restrictions on numbers) and helpdesk employee data.
- Automated import of automatic registrations of returning line tasks
- Administration of spent helpdesk time
- SLA-reporting + invoice appendix spent helpdesk time

2.10 License points

EPO element contains “in the box” sufficient license points (100 EPoints) to aim one of the key features (CustomerCare - helpdesk, chain monitoring or remote monitoring) with 1 or 2 user clients.

EPO-license points (EPOints) are dynamically usable. EPoints can be used for enabling functionalities, probes (agent) and clients.

The quantity required license points is not stipulated by what is installed, but by what is monitored (= what is in the business tree) and the number of simultaneously started EPO User client:

1) Every end node in the business tree (= simple Managed object) costs 1 licencepoint.
2) Exceptions are:
   - the standard information of windows server: cpu, diskspace, memory, eventlog and services (5 epoints per server)
   - snmp-information of a router/switch (3 epoints per router/switch)
   - the (process monitoring of the) helpdesk module CustomerCare (50 epoints)

Simple Managed object cost 1 EPoint for every time the Managed object has been incorporated in the business tree:

- EPO ICMPPing/availability or latency monitoring of an IP-adres
- EPO HTTP-monitoring of a web address
- EPO SNMP-monitoring of a simple object ID
- EPO openInterface monitoring with an external script
- EPO performance Counters

The license points for the use of the EPO business client:

- EPO Administrator client : 20 – 25 Epoints*
- EPO User client : 15 Epoints per concurrent user*

- EPO Viewer client (read only) : 5 Epoints per concurrent user*

* In EPO Elements 5.0 there is only 1 type of client. The defined role (with rights) will determine the number of used license points.

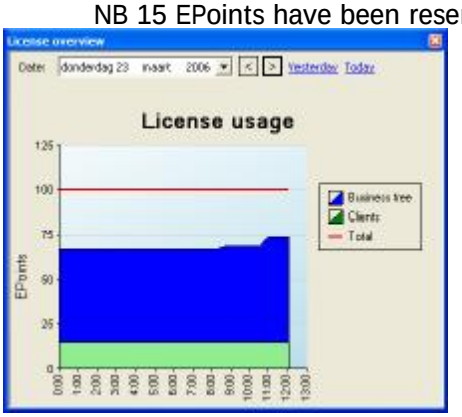
The required license points for room monitoring:

- EPO room monitoring : license by means of the hardware

2.10.1 License points in use

The standard node “License Overview” shows the total number of license points that is in use. In the graph is shown:

- **Total owned EPoints**
  The line which reflects how many EPoints are bought and therefore how many EPoints can be used.
- **Business tree**
  The quantityEPoints which is in use in business tree
- **Client**
  The quantity EPoints which is in use by (*concurrent*) users.
  NB 15 EPoints have been reserved permanently for one user.



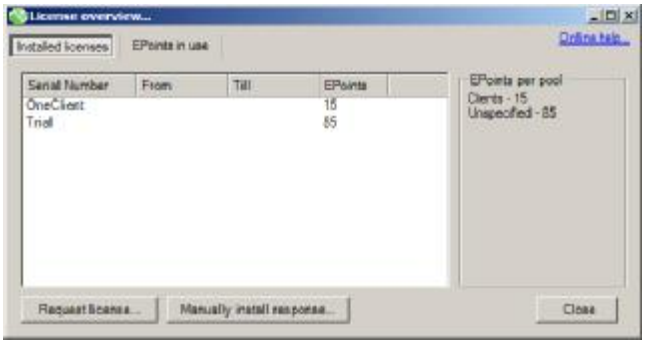
Character 1 License points in use

NB also on course of the license points gebruik can be established proactive guarding. For that the threshold values fill in at modifying business tree grudgingly.

2.10.2 License overview

The menu option “Help \Manage Licenses...” will show an overview over the obtained licenses.

Handbook EPO Elements

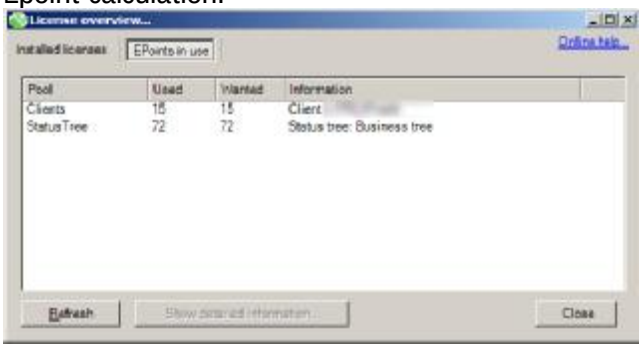


Character2 License overview

NB every installation of EPO element contains in advance the first 15 Epoints that are needed for starting at least one EPO user client.

License points in use

Select “Epoints in use”, select a pool and select “Show detailed information” for specific Epoint calculation.



2.11 Language

In the logon window you can select a language (English and Dutch). The labels of the Business tree and dropdown menu's in the Helpdesk module can be set by the user in any language.

For the Business Tree: build the tree (menu option: edit \ Business tree \ ...) in your desired language.

For the dropdown menu's in the Helpdesk module: define your own items (menu CustomerCare \ lookuptables \ ...).

3 Installation

3.1 System requirements

- Windows: version: XP, 2000, 2003 or Vista.
- CPU: minimum speed: as from 1 GHz
- Free disk space: minimum as from 10 Gbyte
- Memory: minimum as from 1 Gbyte
- Microsoft .Net Framework: version 2.0 sp1

3.2 System recommendations

- CPU: recommended speed: as from 2 GHz
- Free disk space: recommended as from 80 Gbyte
- Disks: SCSI or SAS
- Memory: recommended as from 2 Gbyte

Optimal performance of EPO Elements is obtained by using EPO on a server without other applications.

3.3 Database

EPO Elements uses a file database for storing measurements.

EPO CustomerCare standard is installed with the database Firebird (http://firebird.sourceforge.net/).

Advantages of this database:

- For free, compactly and simply in maintenance
- Commercially independent
- Supported platforms on Linux, Windows, and several Unix

Organizations which want make themselves (further) reports with a report generator such as for example Crystal reports are recommended another database, for example Microsoft SQLServer.

EPO CustomerCare can use also of other databases, for example:

- Microsoft SQLServer
- Microsoft Desktop Edition (MSDE)
- Microsoft access
- Oracle

3.4 Installation preparation

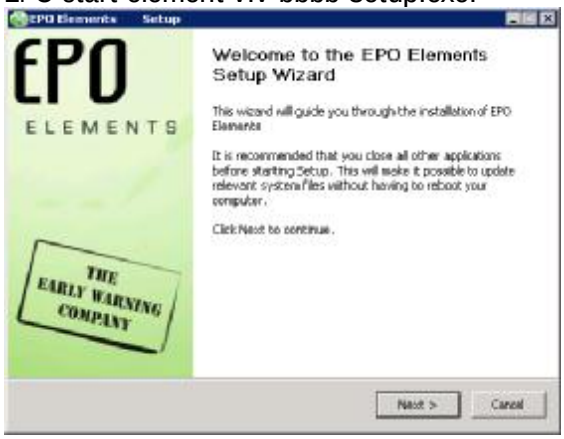
Account:

§ Installation account with administrator rights

3.5 Installation

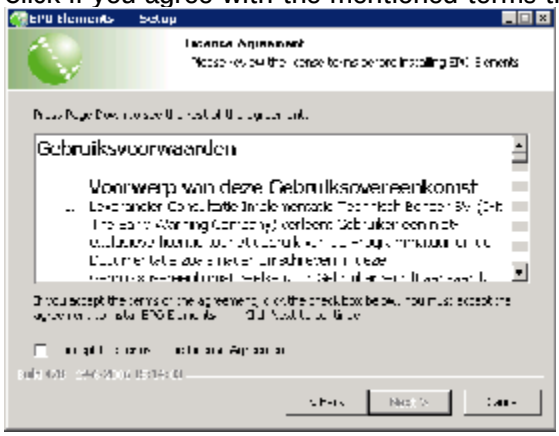
1. EPO start “EPO element v.v-bbbb Setup.exe”. Where v.v the version and bbbb the build number.

    1. EPO start element v.v-bbbb Setup.exe.



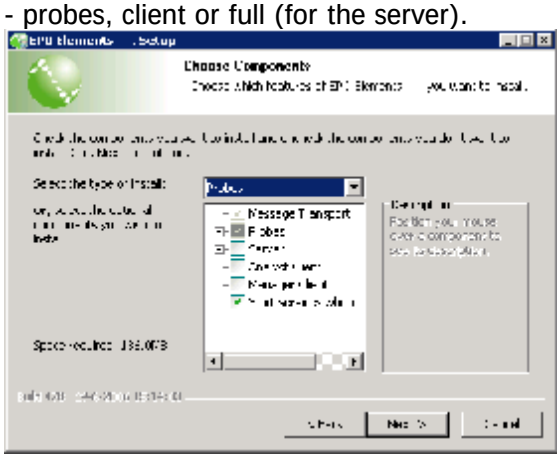
Click <Next>.

    2. Click if you agree with the mentioned terms the checkbox “I accept ...”



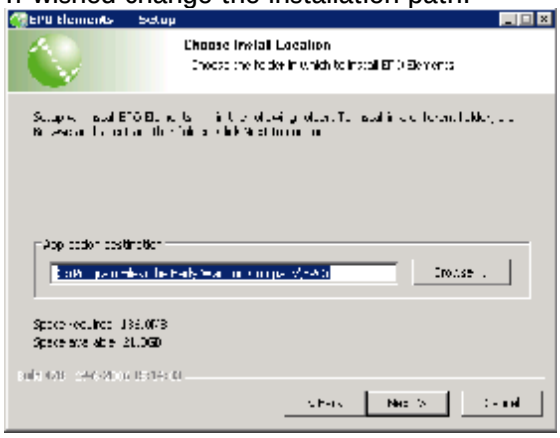
Click<Next>

    3. Select the required type of installation:
    - probes, client or full (for the server).



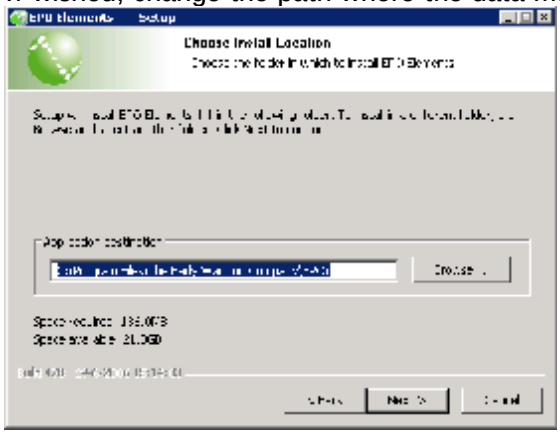
Click <Next>

4. If wished change the installation path.



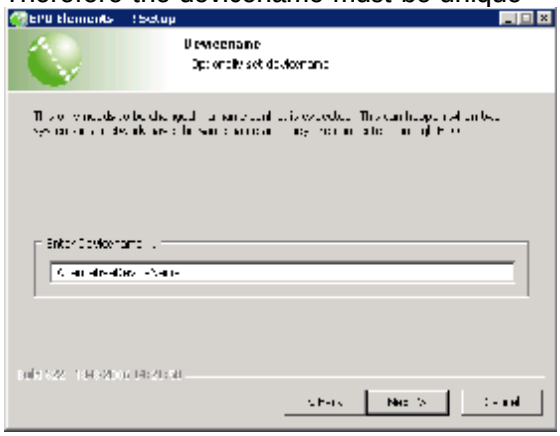
Click <Next>

5. If wished, change the path where the data must be stored.



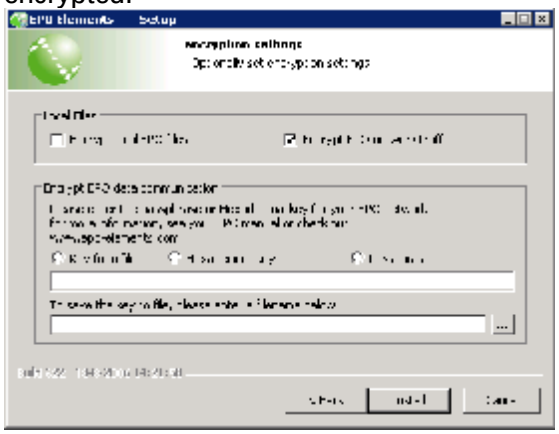
Click <Next>

6. If wished, modify the name under which the machine in the EPO network comes available. This is necessary for identifying the desired measurement when measurements are mapped upon the Business tree. Therefore the devicename must be unique



Click <Next>

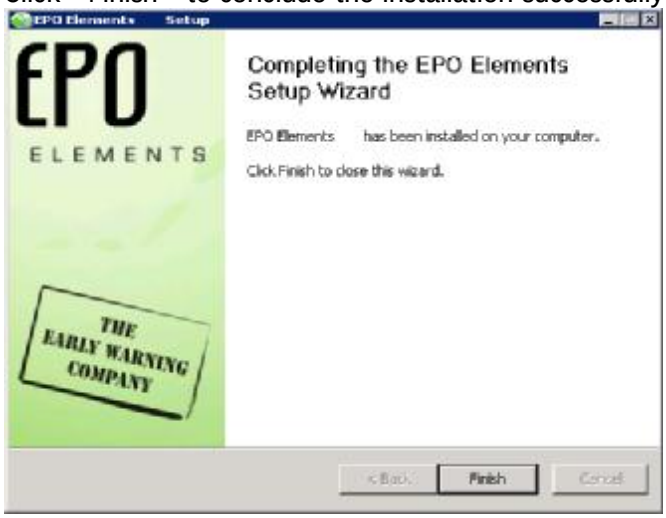
7. Encryption Settings. The setting files and the data communication can be encrypted.



Click <Install> to start the installation

8. If antispy software is installed, these should allow the EPO installation to install de EPO services. The antispy software will possibly ask for authorisation.
   Examples:

9. Click <Finish> to conclude the installation successfully.



EPO Elements is now ready for use.

See paragraph 2.4, “Services”, page 9, for an overview of which components are installed during the EPO installation.

3.5.1 Upgrade

All EPO Elements 4.x versions can be upgraded during the 5.0 installation. The installation detects which version is already installed. Changes in database or measurement structure will be applied during the installation process.
NB Make a complete backup of the program AND data directories for failover purposes.

Set-up detects which components are already installed and will reselect these checkboxes in the option list. Reapplying the setup.exe will first deinstall all already installed options and then install the selected options. Deinstall and reinstall an option will not harm the configuration for that item.

3.5.2 Automatic installation

The installation wizard has been built with NSIS (Nullsoft Install system)

EPO components can be installed without interaction *(*silent *and* unattended). The installation options can be supplied in an .ini file:

```
[Settings]
;INSTDIR="C:\Program files\The Early Warning Company\EPO"
;INSTDATADIR="C:\Program files\The Early Warning Company\EPO\Data"
;DEVICENAME=
;LocalEncryption=1
;NetworkKey=AFB5B8A65E25BB81AFB5B8A65E25BB81
;NetworkKeyFile=
StartServices=1

[Components]
EPOMsgSvc=1
EPODiasporaSvc=1
EPOProbeSvc=1
EPOProbeSvc_Windows=1
EPOProbeSvc_Common=1
EPOProbeSvc_Network=1
EPOProbeSvc_Security=0
;EPOProbeSvc_Checkit=0
;EPOProbeSvc_DemoData=0
;EPOProbeSvc_Version3=0
;EPOServerSvc=1
;EPOMailGatewaySvc=1
;Client_User=1
;Client_Viewer=0
;Client_Diaspora=0
```

An option is installed if it has the value 1. An option is left out if preceded by a “;”. If an option is not specified then the last used setting is taken (by example during setup).

Use:
Setup.exe [/S] /options =<**complete** ini path>

For example:
EPO element setup.exe /options=C:\Projects\EPO\Setup\Installoptions.ini

3.6 EPO Internet client

The EPO client can be also connected by means of the Internet or other network connections to the EPO-server.

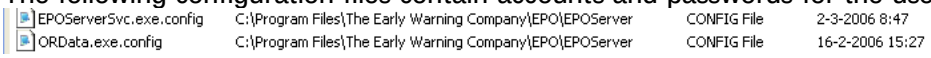
Required configuration:

Description	Configuration
By means of VPN	No extra configuration is necessary. The EPO User client finds at starting automatically the EPO-server (by UDP broadcast). Optionally: specify the server address (by resolvable name or ip)
Direct	By means of NAT (Native Address Translation) the concerned network components can be configured to make the connection possible. Intermediate firewalls and routers/switches between the domains must be set open for: - EPO : port 7471 TCP.

3.7 Post installatie points

3.7.1 Security

The following configuration files contain accounts and passwords for the used database:



Tip: Protect these configuration files by limiting access to the system administrator.

3.8 Uninstall

Use the UnInstall-EPO-application in the standard program files folder for removing the EPO components.

Or use the standard Windows control panel for add/remove software.

3.9 Encryption

EPO can protect both the local settings files as well as the network communication by means of encryption. EPO uses 256 bit Rijndael encryption (AES). During the installation you can indicate what should be protected.

You can specify a key yourself in hexadecimal. It is also possible to use a passphrase. This will be converted to a key. The third possibility is reading a key from a file. This file can be generated from the installation by specifying a filename in the bottom field. The file can be used then as an import at another installation to simplify the roll out.
Another manner will generate the key file using the tool EPOMsgCmd.exe from the tools directory.

With the option - kf you can specify a key file to modify the current security key. In the same a manner it is possible to specify a passphrase with - kp and – k.

4 Use

4.1 First Logon

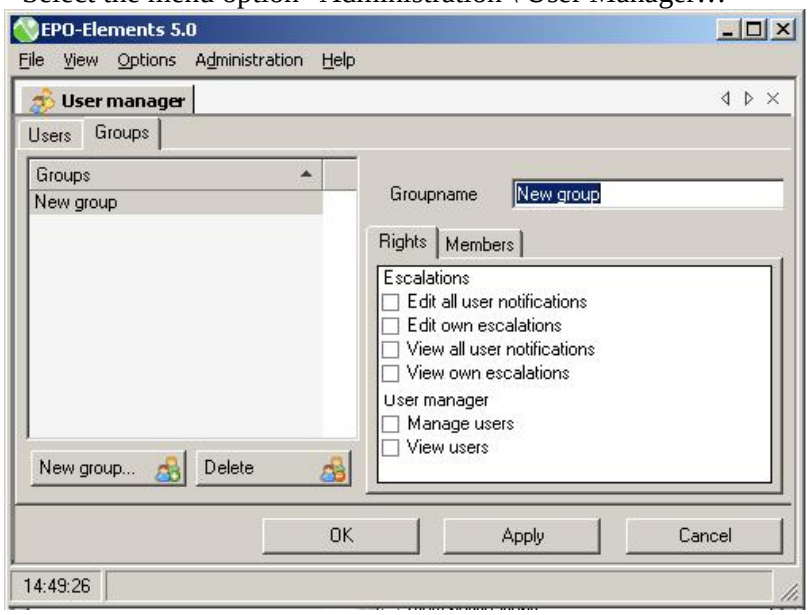
The first time you start the EPO User client, there is not yet an user profile defined in EPO Elements.

You have to perform the next steps:

1) Start on the EPOServer the EPO User client as an administrator.
(only the administrator can use the emergency logon)

Select the option “Emergency logon”.
You will receive the message “unknown user or password” because the administrator is not yet a registered user.

2) The EPO User client is started with a menu with minimal menu options.
- Select the menu option “Administration \ User Manager…”



- Select the tab page “Groups”
- Click button “New group…”
- Specify the name of the group (Example “EPO Administrators”)
- Select the “Rights” for the group

- Select the tab page “Users”
- Click button “New User…”
- Specify the user name (if the user should be managed by the OS make the name exactly the same as the already existing OS account (EPO-server or Active Directory if the EPO-Server is a domain member).
- Select the group(s) that the user belongs to.
- Apply the changes and close the EPO User Client

3) Start EPO User Client and logon with the just specified account
   - Select menu option “Administration \ Manage Business Trees…”
   - Click button “Add Tree…”
   - Specify a name
   - Select the groups that should have access according their specified functional rights

4.2 License activation

The activation of the licensee can be carried out with a proper Internet connection within a couple of minutes.

The following 5 follows steps:

Step 1

- Select Request trial in the License reminder...:

Or (if the User Client is already started)

- Select the menu “Help \ Manage licenses...” and click afterwards the button “Request license”

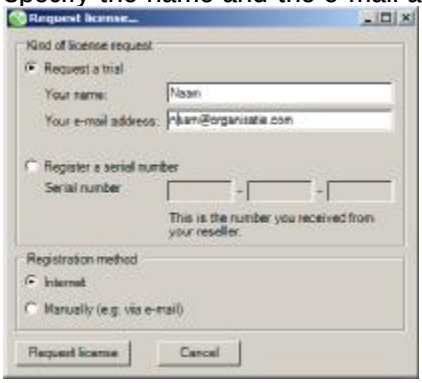
The license can be activated in two ways:

1) Temporary activation by means of a trial trial-licentie.
2) By means of the serial number obtained at purchase of the software

4.2.1 Request a trial

Step 2a

Specify the name and the e-mail address of the applicant:



See step 3.

4.2.2 Register a serial number

Step 2b

Specify the serial number that you have obtained by means of your reseller.

See for step 3.

4.2.3 Registration Method

Step 3

The request can be passed on in two manners:

1) By means of the Internet; directly to the license database (C-it)
2) Or manually; by e-mail to the manufacturer (C-it)

4.2.4 Registration by means of Internet

Step 4a

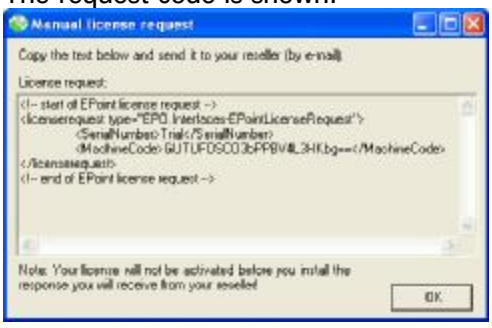
- Select the option “Internet” if is there a Internet connection
- click on Request license

- The license response file send directly to the given mail address
- continue after reception with step 5.

4.2.5 Registration by mail

Step 4b

- If there is no Internet connection possible then select the option “Manually”
- click on Request license.
  The request code is shown.



- copy the whole text

- mail the copied text to your reseller
- continue after receiving an answer from your reseller with step 5

4.2.6 License install response

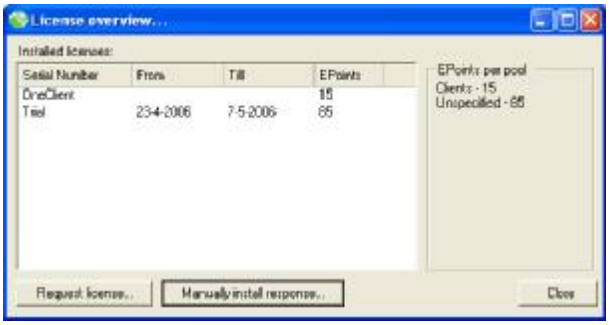
After the license response have been received on the given mail address this last step can be carried out.

Step 5

- Copy the text in the response mail

- Select the menu “Help \ Manage licenses...”
- Select the button “License overview...”
- Paste the copied license response

- Click on Install
- The license has been now activated.



Handbook EPO Elements

4.2.7 Reminder

The trial license can be used for 14 days.

4.3 Basic information

4.3.1 EPO State information

Node color	EPO State	Meaning
Green	*Normal*	The node and all underlying nodes meet their specified thresholds *
Yellow	*Warning*	The node (or one of the underlying nodes) contains a value which exceeds the warning threshold *
Red	*Critical*	The node (or one of the underlying nodes) contains a value which exceeds the critical threshold *
Black	*Down*	The node (or one of the underlying nodes) contains a monitored component which does not react to the information requests from the EPO-probe *
Blue	*Unknown*	The state of the node (or of the underlying nodes) cannot be determined *
White	*None*	- The node is empty - or the node and all underlying nodes have no monitoring specified (= no thresholds)

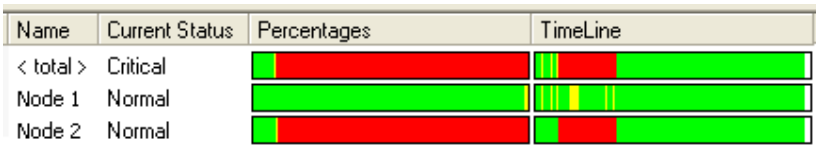
* NB nodes can be specified explicitly not to propagate.

4.3.2 Propagation rules

Nodes
The state of a node in the business tree is propagated on the basis of “worst case”, the order is:

- unknown (blue) goes above down (black) goes above critical (red) goes above warning (yellow)

Service levels (SLA)
Service Levels (Service Level Agreement = SLA) are propagated on the base of the aggregation of all periods of unavailability of underlying nodes (according their thresholds).



Character3 example of the aggregation of underlying SLA's

In the example above the first row (matching to the selected node in the business tree) is the sum of the periods of unavailability of the rows (= underlying nodes in the Business Tree) below.

4.3.3 Exceptions on the propagation rules

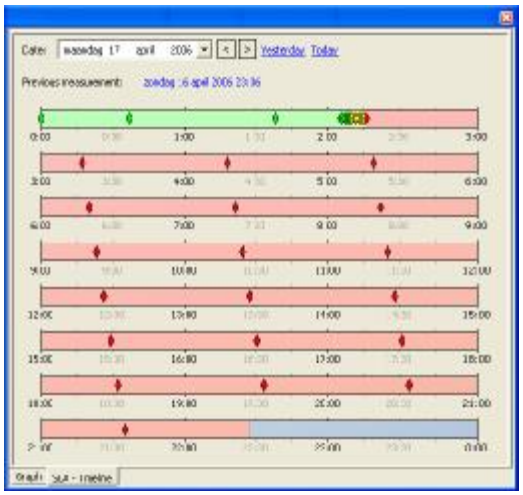
Exceptions on the standard propagation rules are as follows reflected:

Node	State	Meaning
Dark green	Maintenance	All underlying nodes have been placed in "Maintenance".
	Blockade (because of "Maintenance")	The (here red) node has been placed "Maintenance".
Dark grey	Maintenance Window	All underlying nodes fall outside the Service Windows
	Blockade (because of Service Window)	The (here red) node falls outside the service Window

4.3.4 SLA timeline

Every node in the Business Tree has a SLA-timeline.

The SLA-timeline reflects the state information of a certain node on a certain day (the system date (=default) or a chosen day):



- From time 0:00 to 24:00 the state of the node by means of an indicating color at a certain time or during a certain period
- The color passages indicate the change of state.
- If it concerns an end node the performance indicators in the time line (the diamonds) reflect the state of the actual test moments (every diamond is a measurement in the database)
- The state of a node is stipulated by the established thresholds of the node. If it concerns not an end node the state is the aggregation of the underlying states.

4.3.5 Measurements

The pattern in which the performance indicators (diamonds) are shown is stipulated by the configuration of the associated probe. It can be adjusted that measurements are passed on a fixed interval or that they passed on at sufficient deviation of the previous measurement.

4.4 Base skills

Recommendations how to go with the EPO business tree:

1) Take care that the EPO business tree becomes green after an escalation solving the incident.
2) If a node is escalating state is different than *normal*) for a longer time, think of one of the following:
   - adapt the thresholds
   - place the node in an “Maintenance-group”
   - remove the node from the Business monitoring

4.5 First use of the Business Tree

One of the most important first steps is arranging the Business Tree.
The Business tree can be modified by:

- choose in the menu Edit the sub-menu Edit business Tree
- in the Business Tree with right mouse click “Enter edit mode”

See paragraph … for explanation of the Business Tree editor.

4.5.1 CustomerCare (helpdesk)

CustomerCare is the helpdesk support module. By means of simple recording and effective procedure monitoring appointments with customers can become complied with concerning the lead time of presented incidents, problems or questions.

CustomerCare has been developed support the registration process on basis of simplicity.

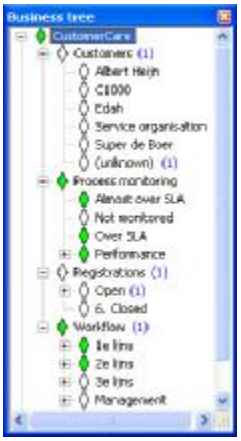
Example how CustomerCare can be used.
Make a registration of an incident report of a customer:

- choose from the menu helpdesk: New registration

- Fill the relevant fields in: summary, description,...
- E.g. the persons involved (click on...): -the affected end user - the colleague to whom the recording is granted

Fill in the type of the recording: incident, change, problem,...
Mark that:

- As the affected end user at a customer has been selected and it has been chosen as priority that then the “need by date” is filled in by means of the SLA which has been coupled to the concerning customer.
- The person to whom the recording has been granted can retrieve the recording in its own todo - bucket under workflow...



- There are under CustomerCare-node 4 approaches to the registrations:
  1) from the customers point of view
     - which registrations are open at a certain customer
     - the possibility to be rapidly warned for certain customers as too much are open
  2) From the process:
     - which registrations stand there open
     - which registrations are over the agreed time
     - but especially also which threaten come within 4 hours over the SLA time.
  3) From the registrations themselves: open, closed.
  4) From the workflow/workload
     - who has which registrations on its name
     - who has there (at) many registrations on its name

4.5.2 Room monitoring

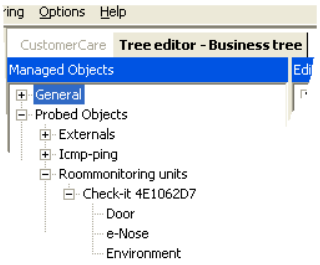
The Room monitoring Unit can be connected through a network connection on the network segment where an EPO probe (agent) is installed.

Character4 Checkit Room monitoring unit (RBU)

Ip-adres the Checkit (visible in posting) and will try contact zoeken ask with checkit probe by means of DHCP.

Checkit probe are activate by by means of the epo analys client by means of the menu edit probe configuration, a machine in the same segment, desired after probe probe-icoon on, (where EPO-probes are installed) to have selected on enabled the checkitprobe to put.

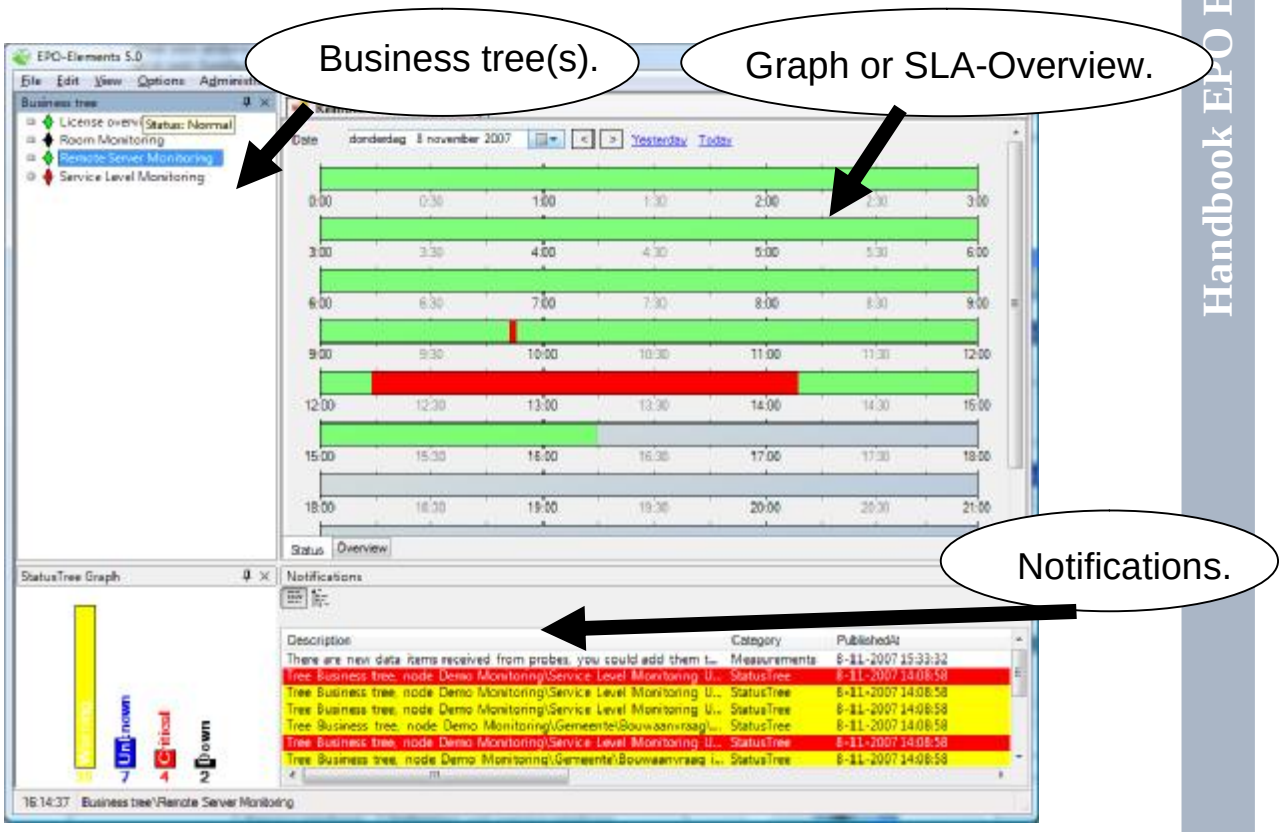
Afterwards (after a couple minutes) the new checkit is selectable by means of drag-and-drop in the Toolbox Window in the TAB page “RBU”.



5 EPO-Functionality

In this chapter EPO-functionality is listed by describing all menu items.

5.1 Layout of the EPO User Interface



5.1.1 Layout of the EPO Windows

All windows (Business tree, StatusTree Graph, Notifications, ...) and separate tab pages can be drag-and-droped:

- towards another place in the main window
- or to another existing tab structure
- or outside the main window (multiple screens)

5.2 EPO-menu structure

Menu	Sub-menu	Description
Edit	Edit business tree...	To adapt a business tree
	Disabled Tree	Use the list of temporarily disabled tree nodes. Typically when components are being serviced.
	Edit probe	To configure:

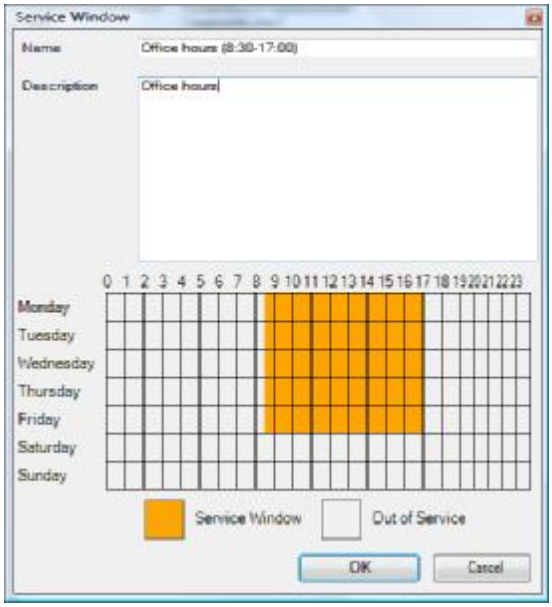
	configuration...	- probes - communication layer

Menu	Sub-menu	Description
View	Business Trees	
	Business Tree Graph	To show diagram bar with number of open notifications
	Task Panel	<not used>
	Notification...	List containing all notifications (state's other than normal).

Menu	Sub-menu	Description
Options	Layout Locked	
	Auto connect to server	

Menu	Sub-menu	Description
Administration	Service window	Definitions of services windows. Can be applied to nodes (in edit business tree mode)
	User manager	Definitions of users, groups and (allowed) functionality.
	Measurement database	Administration of the measurement database
	Manage business trees	Administration of the Business trees (add, remove and map to allowed groups)
	Escalation rules	Definitions of escalation rules (trigger an escalation to email, SMS or application)

5.2.1 Service Window



Service windows are used to limit escalations to the service hours.

Defined service windows can be applied to:

- a business tree node
  escalations will only be propagated within the service window
  See §4.3.3, "Exceptions on the propagation rules", page 26.
- an escalation rule
  actions will only be activated within the service window

Use the create-button to define a new service window.
Drag a square with the mouse for the desired service window or click for individual time

slots (smallest part is 15 minutes).

5.2.2 User Manager

Use the user manager to define users, groups and allowed functionality.

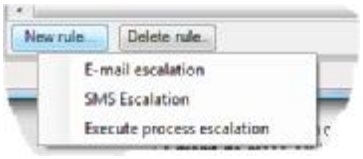
Password: choose if the password should be managed by the Operating System (default) or by EPO.

5.2.3 Escalation rules

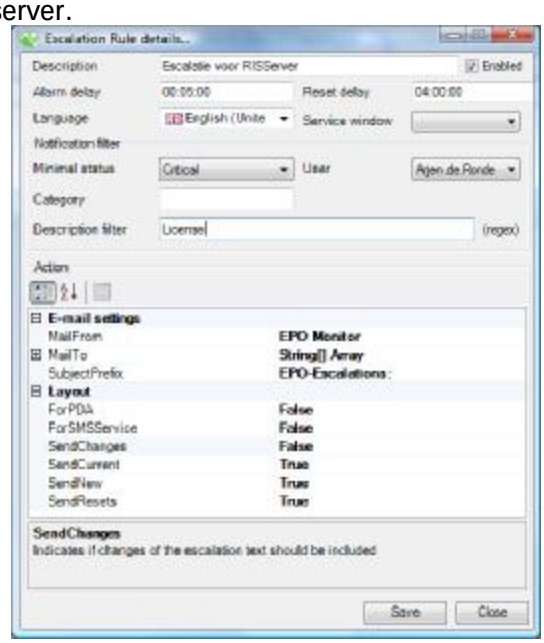
A notification is raised after a threshold value is violated (all visible in the window Notifications). An escalation rule can be used to activate an action as follow-up.

Use the “New rule…”-button to define a new escalation rule. Choose the desired follow up action:

- E-mail (required is a mail server that allows relaying for the EPO server)
- SMS (additional hardware is needed)
- Execution of an process



For configuring the email gateway see § 10.6, “EPO Mail gateway”, page 61 for specifying a smtp server.



The most straightforward and therefore the simplest way of using an escalation rule is to specify only:

- Description : title of the definition
- Minimal Status : perform the escalation action for this state and worse
- Description Filter : unique string identifying the notification (by example the (unique) node path from the business tree (right mouse click on node and choose “copy to clipboard” and paste over here))

All settings:
Alarm delay (hh:mm:ss) : the alarm (action) will only be performed when the error state (minimal status) is raised for this period. Typically used to prevent single measurements to escalate. Also used in combination with “Reset delay” to prevent a burst of notifications lead to a burst of escalations (messages).

Reset delay (hh:mm:ss) : amount of time the monitored item should be in “a not error state” before performing the reset (action). This means that after the monitored item is not any longer in an error state and after this amount of time has been elapsed the reset (action) is performed. New Alarm (actions) will only be performed after the reset delay. Typically used in combination with “Alarm delay” to prevent a burst of notifications lead to a burst of escalations (messages).

Service Window: the escalations rule is only active in the defined service window (time frame)

Minimal status: the escalations is only triggered for notifications that apply to the specified status AND worse (the list order is sorted from less to worse). Use None if the Status is already part of the description filter.

User: the escalation is only triggered for this specified user or all users if nothing is specified.

Category: <not used yet>

Regular Expression
Description filter: expression to define which notifications should escalate to the defined action. The filter can contain:

- A simple string defining one or more notifications to escalate on
- A more advanced (regular) expression (a regular expression (= a sort of advanced wildcard))

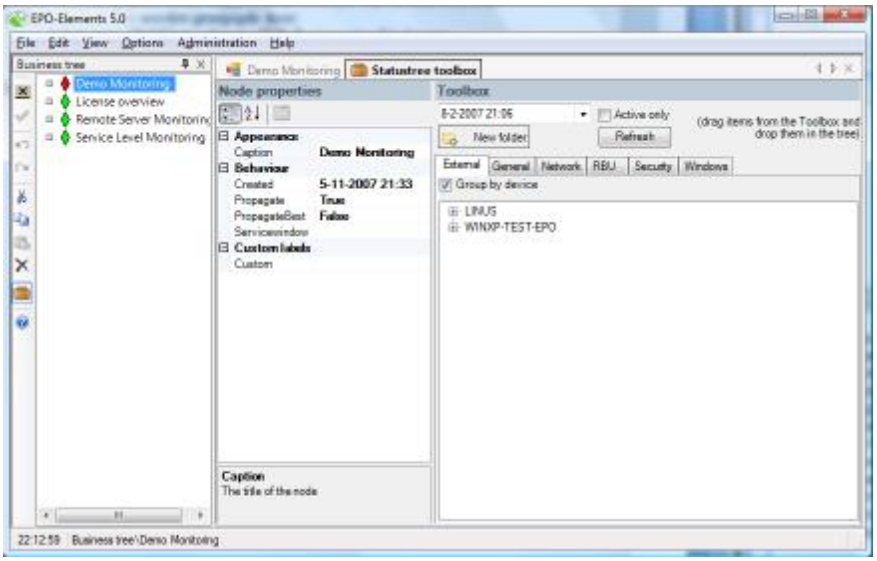
The description filter is applied to the description of the notifications.
To build a description filter use the node path (or a part from it) from a Business Tree (right mouse click Business Tree – copy node path to clipboard) or use the notification description (right click on a notification – copy description to clipboard).
Syntax of the description of a Notification:
(Tree <name>, node <complete node path> is <status>).

Use normal text for straight forward text compare and use the more advanced characters of regex to define patterns like:

- ^text : text should align start of the notification description
- text$: text should align end of the notification description

For more advanced definitions see one of the many tutorials on the web for regular expressions.

6 Arranging the Business Tree



The Business Tree editor consists of three components:

1) **Left window: The business tree(s)**
   This is the definition of the Business Tree which can be modified by taking away nodes or add monitored components by add nodes. On “save” the modifications will be applied on the Business Tree (for all connected EPO User Clients).
2) **Middle window: The node properties**
   Here for example thresholds can be modified or can be indicated if a node must propagate its state.
3) **Right window: The toolbox**
   The toolbox is the set of items with which the business tree can be extended. It contains templates, new folder structures but most of all the measurement types monitored by the probes.

The Toolbox consists of several categories (External, General, Network, RBU, Security and Windows). All components (and also compositions of components) can be drag-and-droped to the editable business tree. The categories are:

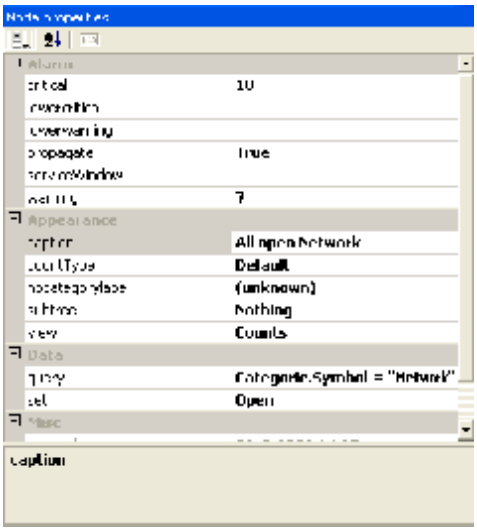
1) **Windows**
   Results of the default windows probes (CPU, memory, disk, services, events)
   Drag-and-drop a complete windows server group to a place in the Business Tree.
2) **General**
   - Customer Care Query: can be used to make specific helpdesk views.
   - Folder: important element to make groups of monitored components that combine to one Service Level (SLA).
3) **Network**
   Results of the network probes: ping, snmp and web
4) **RBU (Room monitor)**
   If you attached the Room Monitoring Unit from within this TAB you can drag-and-drop the measurements: temperature, voltage, humidity and from the eNose: scorching and Volatile Organic Compounds.

5) **Security**
   If you connected a webcam it is possible to enable the photo function with the triggers from the room monitor (by example door contact).
6) **External**
   Results of the open interface probes (external probes).

6.1 Additional CustomerCare Query

The CustomerCare default tree can be extended with additional views. In the Tree editor a node called “CustomerCare Query” can be dragged to the desired spot in the editable Business Tree from the Managed object.

Adjust the query with the required variable from CustomerCare.



Examples:

- Categorie.Symbol = “Network” for all registrations whereas the user selected “Network” as the category.
- Categorie.Symbol = “Citrix”
- RegistrationType.Symbol = “Incident”
- (NeedByDate >= Today()) AND (NeedByDate <= Today(timespan("23:59")))
- CloseDate.Date <= Now(timespan(“-12:00”))

Other variables that can be used:

- RegisteredBy.Symbol
- MonitorSLA.Symbol
- Categorie.Symbol
- RegistrationType.Symbol
- Impact.Symbol
- Priority.Symbol
- Status.Symbol
- Summary.Symbol
- Description.Symbol
- ExternalReference.Symbol
- Solution.Symbol
- Notes.Symbol
- Assignee.Symbol
- Requestor.Symbol
- AffectedEndUser.Symbol
- Publish.Symbol

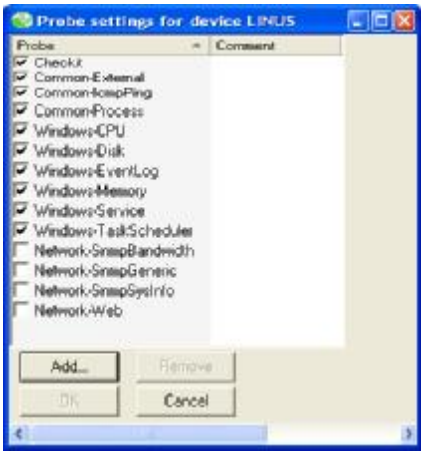
7 EPO probes (agent)

In the following paragraphs it is described which information can be collected by the EPO probes.

7.1 To add new probes

By means of the menu “edit probe configuration” probes can be added or changed.
EPO Probed computers have green icon (monitor-with-pulse-graph), Clicking this will lead to the probe settings for the selected computer.

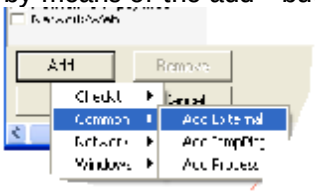
The listed probes in the next image belong to the default monitor settings of EPO. The probes marked with checkbox are actively (on that selected server) and collect therefore measurements.



Character5 standard EPO probes

A probe can be added by:

- activate a not yet activated probe (select checkbox and configure...)
- by means of the add - button to add additional probes.

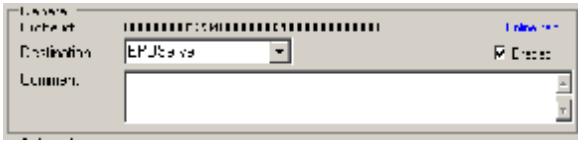


7.2 Use a template for probe settings

Probes and probe settings can be copied from one device (i.e. an example or template device) and be pasted to another device. To do so:

- select one or more probes in the probe settings list and right mouse click + copy
- open the probe settings of the target machine and choose right mouse click + paste.

7.3 Probes: General properties

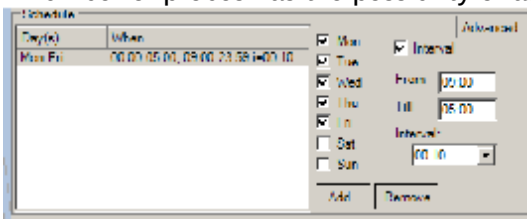


There are a number of properties which apply to all probes.

Destination: Sets the destination of the measurements of the probe, default is EPOServer, which is the default name of the eposerver.
Enabled: switch the probe on or off.
Comment: gives a short name to the the probe. This will be shown in the general probe settings window.

7.3.1 Advanced schedule settings

A number of probes has the possibility of advanced schedule settings.



A schedule can be established with and without interval. Several schedules can also be established. In the example is a schedule defined for running the probe from Monday to Friday, between nine up to five o'clock with an interval of 10 minutes.

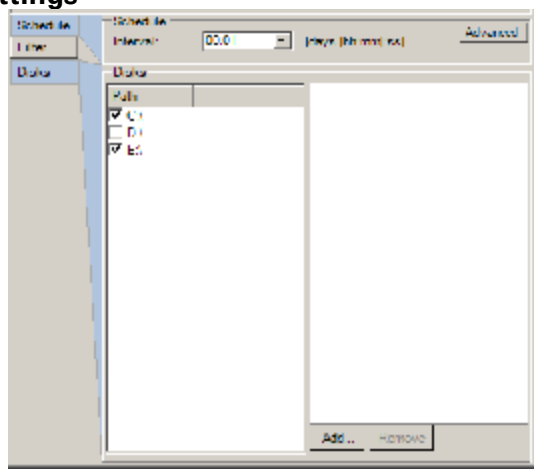
7.4 Disk probe

Functional

The Disk probe measures the space usage of a logical drive as a % of the total capacity.

At the first activation of the probe, these will produce a list with the available drives on that particular machine. Network drives are not captured and drives for removable media are, however, incorporated in the list but are default not activated.

Settings



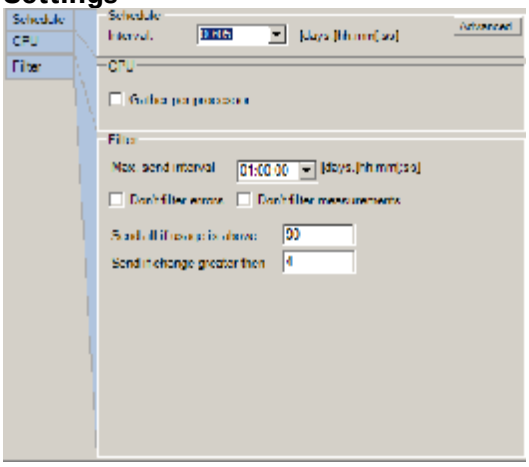
Interval: the probe will measure with this frequency. The specified interval is the amount of time between the end of the last measurement and the start of a new measurement.

Filter
The measurements are forwarded to the EPOSERVER according the filter settings.
Maximum. Send interval: The maximum time whereupon a new measuring is always sent, independently of other filter settings.
Don't filter errors: the filter is not applied for errors.
Don't filter measurements: the filter is not applied on ordinary measurements.
Send if change greater then: Filters measurements on base of change. As a new measurement is less than the indicating % or number of bytes compared to the last sent measurement, these new measurement will not be sent.
Disks: With the Add and remove button new disks can be added which do not appear in the default list.

7.5 CPU probe

Functional
The CPU probe reads the usage of the CPU from over the specified interval. The CPU-usage is the calculated average for this interval. The probe can cope with several logical or physical CPU's.

Settings



Interval: Time for which the average CPU-usage is calculated. With the advanced button more complicated schedules can be established.
Gather by processor: The measurement is sent for each processor or only as a calculated total.

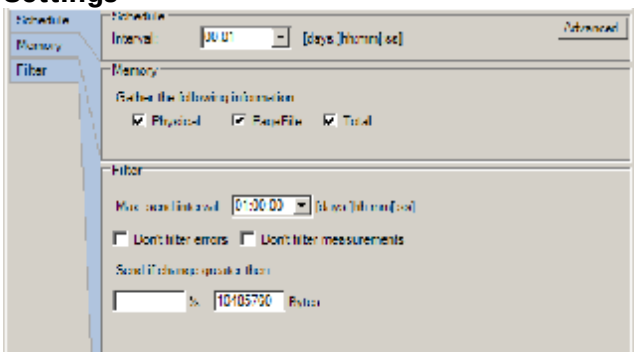
Filter
Maximum. Send interval: The maximum time whereupon a new measuring is always sent, independently of other filter settings.
Don't filter errors: the filter is not applied for errors.
Don't filter measurements: the filter is not applied on ordinary measurements.
Send if change greater then: Filters measurements on base of change. As a new measurement is less than the indicating % or number of bytes compared to the last sent measurement, these new measurement will not be sent.
Send all if usage are above: % The percentage CPU usage above which measurements do not have be filtered.

7.6 Memory probe

Functional

The probe reads the memory usage (totally, used/available) of a system by interval. The probe can be configured to measure physical memory, page and virtual memory.

Settings



Interval: the probe will measure with this frequency. The specified interval is the amount of time between the end of the last measurement and the start of a new measurement.

Gather the following information: Which of the three types of memory must be measured.

Filter

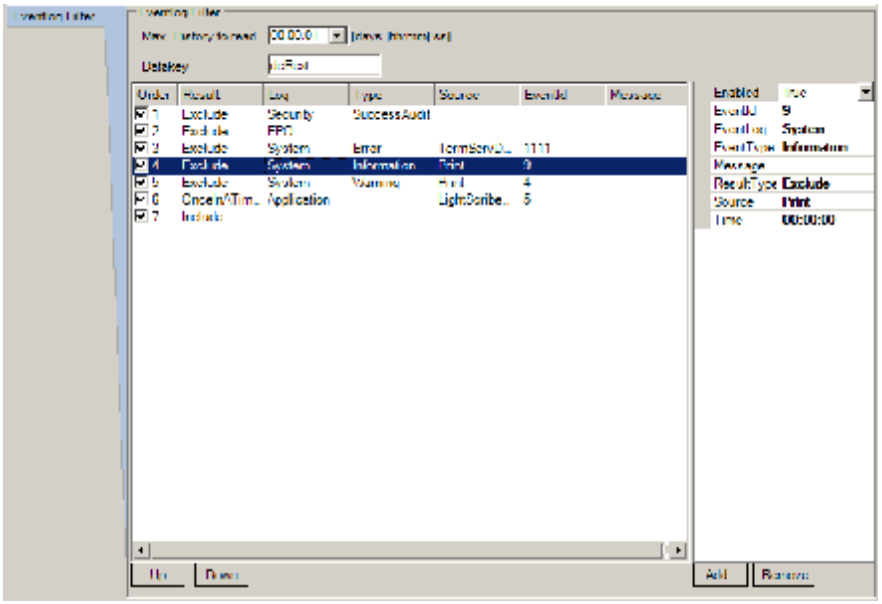
The measurements are forwarded to the EPOSERVER according the filter settings.
Maximum. Send interval: The maximum time whereupon a new measuring is always sent, independently of other filter settings.
Don't filter errors: the filter is not applied for errors.
Don't filter measurements: the filter is not applied on ordinary measurements.
Send if change greater then: Filters measurements on base of change. As a new measurement is less than the indicating % or number of bytes compared to the last sent measurement, these new measurement will not be sent.

7.7 Eventlog probe

Functional

This probe registers events which occur in the windows eventlog of the probed machine. It is possible by means of filtering to measure only a limited number of event types.

Settings



Eventlog Filter
Max. History to read: Maximum period that the eventlog must be read in case of first activation or in case of restarting; 0 means the complete log.
Datakey: Key under which the data from these eventlog probe must be stored. It is possible to activate several probes and give each a separate filter, with this Datakey the results can be distinguished.

Filter
The event log probe knows its own filter method.

The filter has 4 options:
- Include,
- Exclude,
- OnceInATimeSpan and Time.

Include: Use events which meets the conditions
Exclude: Do not use events which meets the condition
OnceInATimeSpan and Time: Events which meet the conditions will be passed once every specified time.

Events will be distinguished by comparing the EventID, the Source, the type of entry and the text, where all numbers in the text are cleared.

Each filter can be established by means of up to 5 criteria: Eventlog, Source, EventID, Message and type.

Multiple filters can be set. Each new windows event will be evaluated according the list order. In the above mentioned example the first 5 filters define the type of messages that should be filtered out. The 6th filter defines that if the new event meets that settings it will only be passed to epo once in the specified time.
Notice: the last filter should be an include definition otherwise no events will be passed.

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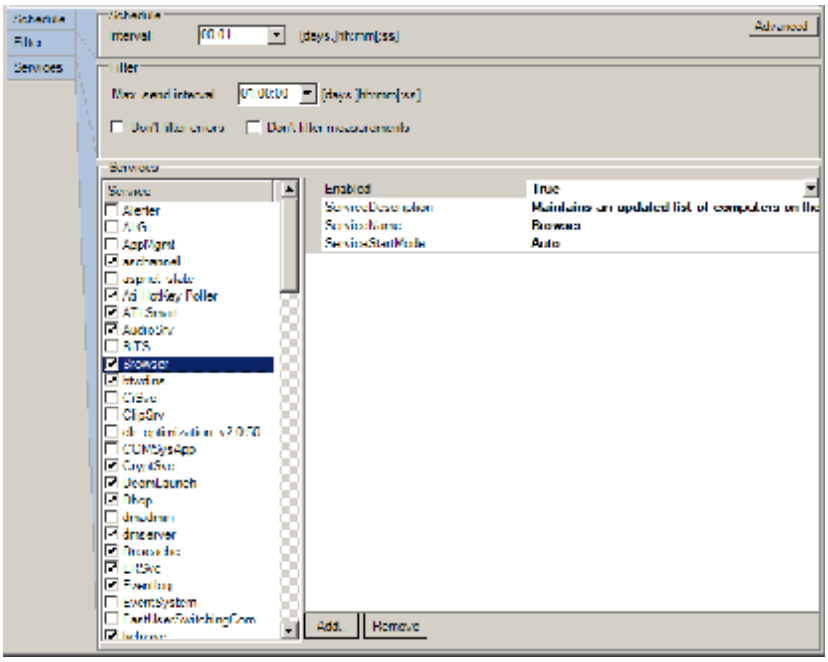
7.8 Service probe

Functional

The service probe passes on the name and state of the services of the probed system.
The probe will also look for new services. By default only the services which are started automatically (at starting Windows), are passed on. At the first time to start the complete list with services is picked up.

7.9 Settings



Schedule

Interval: the probe will measure with this frequency. The specified interval is the amount of time between the end of the last measurement and the start of a new measurement.

Filter

Max. Send interval: The maximum time whereupon a new measuring is always sent, independently of other filter settings.
Don't filter errors: the filter is not applied for errors.
Don't filter measurements: the filter is not applied on ordinary measurements.

Services

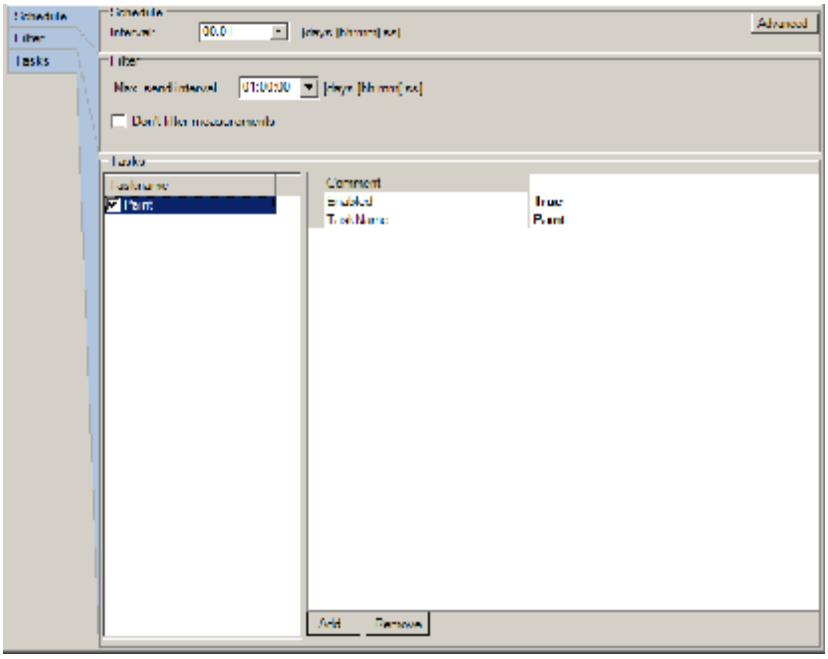
With the Add button new services can be added manually (normally this is not necessary because the probe will look periodically look for new services itself – new services are listed at the tail of the list).

7.10 Task scheduler probe

Functioning

The task scheduler probe gives the list with tasks from the Task scheduler (planned tasks) and their associated state in Windows.

Settings



Schedule
Interval: the probe will measure with this frequency. The specified interval is the amount of time between the end of the last measurement and the start of a new measurement.

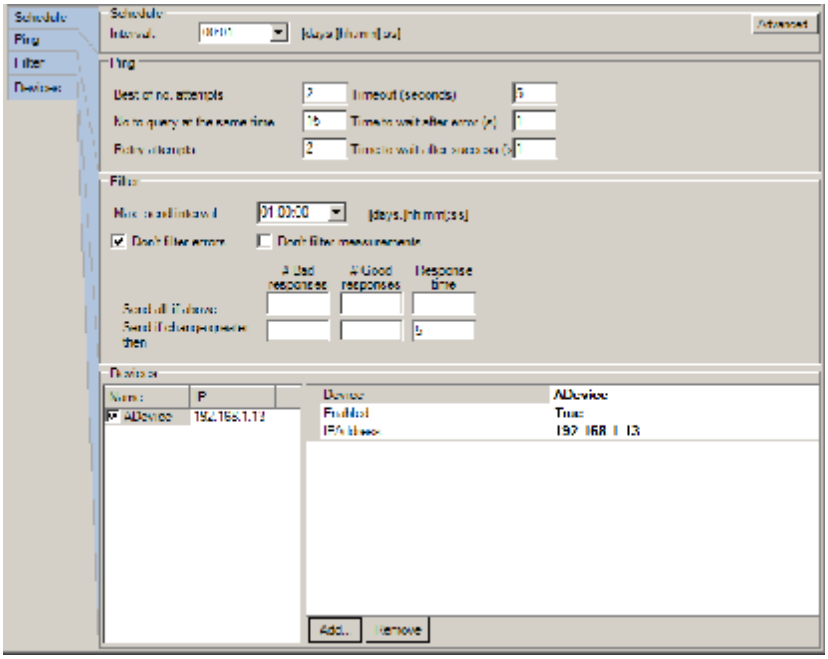
Filter
Max. Send interval: The maximum time whereupon a new measuring is always sent, independently of other filter settings.
Don't filter measurements: the filter is not applied on ordinary measurements.

With the Add button new tasks can be added manually (normally this is not necessary because the probe will look periodically look for new tasks itself).

7.11 ICMP (ping) probe

Functional
The ICMP probe pings from the probed machine to the specified other machines and measures the availability and the response time.

Settings



Schedule
Interval: the probe will measure with this frequency. The specified interval is the amount of time between the end of the last measurement and the start of a new measurement.

Ping
Best of no. attempts: The number of pings that will be used to take the best result. The best time is used.

No. to query ate the same time: Number of parallel pings for this probe. The total amount of pings is the result of (the number of devices x no. attemps).

Retry attempts: how many times will a ping be repeated if there is no reply from the pinged device.

Timeout: Time whereupon 1 ping attempt is considered as failed.

Time to wait after error: Time to wait after failure before a new ping.

Time to wait after success: Time to wait after a successful attempt.

Filter
Max. Send interval: The maximum time whereupon a new measuring is always sent, independently of other filter settings.
Don't filter errors: the filter is not applied for errors.
Don't filter measurements: the filter is not applied on ordinary measurements.

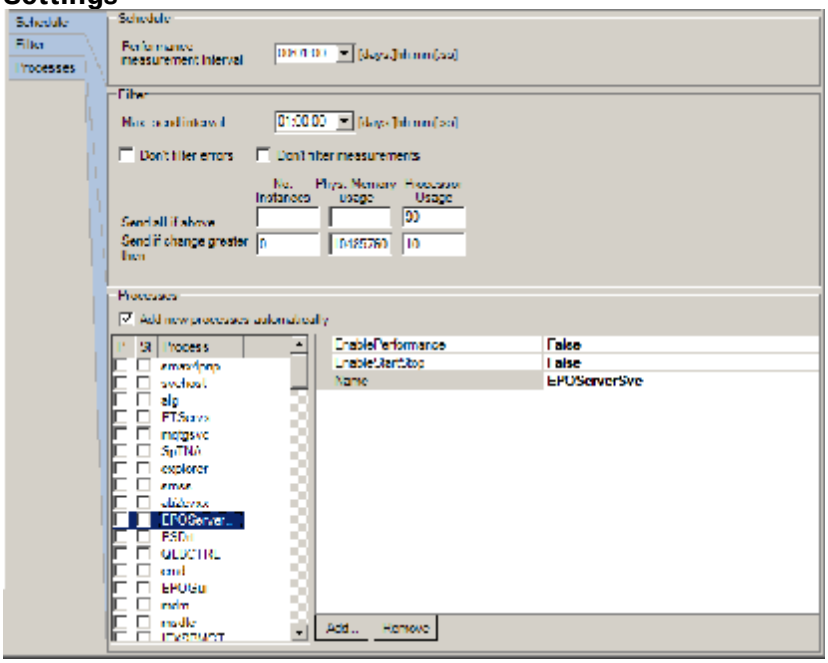
Send all if above: If the number of good/wrong answers or the responsetime comes above this value the measurements are not filtered.

Send if change greater then: If the difference between the current measurement and the last which was not filtered, is larger than this value, the measurement will not be filtered.

Devices
Add: Add a New device to ping. If no ip address is specified the device name will be used to ping to (only use this if the device name is resolvable to an ip address).

7.12 Process probe

Functional
The process probe passes information of the running processes on the probed machine to the Eposerver.

Settings


Schedule
Performance measurement Interval: the probe will measure with this frequency. The specified interval is the amount of time between the end of the last measurement and the start of a new measurement.

Filter
Max. Send interval: The maximum time whereupon a new measuring is always sent, independently of other filter settings.
Don't filter errors: the filter is not applied for errors.
Don't filter measurements: the filter is not applied on ordinary measurements.

Send all if above: If the number of active processes with the same name or the processor/memory usage raise above this level, the measurements are send to the EPOServer without considering the filter settings.

Send if change greater then: If the difference between the current measurement and the last which was not filtered, is larger than this value, the measurement will not be filtered.

Processes

Add new processes automatically: If this option is selected running processes are added to the list automatically. This change must be saved before the results become available (save probe settings and press the refresh button in the Configuration Editor)

EnablePerformance/EnableStartStop: Manages by process if performance and/or the number of running instances are measured.

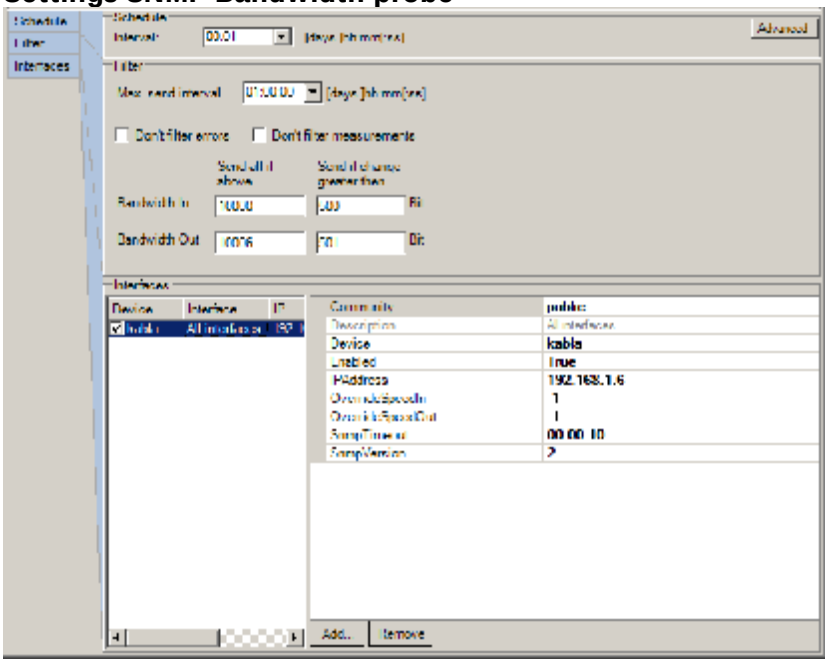
7.13 SNMP probes

Functioning

There are three SNMP probes:

- one for measuring the bandwidth usage
- one for reading the Sysinfo
- and one generic SNMP probe.

Settings SNMP Bandwidth probe



Schedule

Interval: the probe will measure with this frequency. The specified interval is the amount of time between the end of the last measurement and the start of a new measurement.

Filter

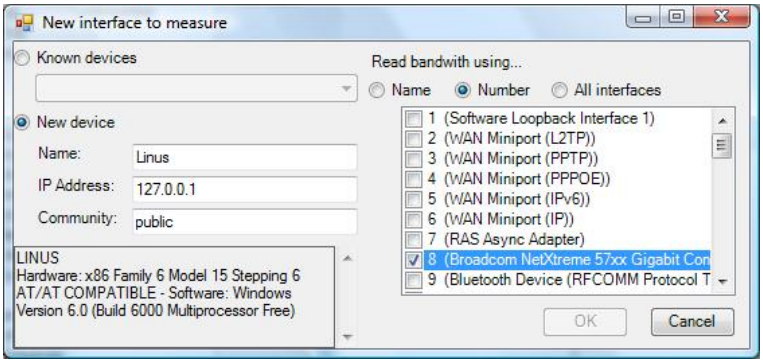
Max. Send interval: The maximum time whereupon a new measuring is always sent, independently of other filter settings.
Don't filter errors: the filter is not applied for errors.
Don't filter measurements: the filter is not applied on ordinary measurements.

Send all if above: If the used bandwidth is more than this value, the measurements are not filtered.

Send if change greater then: If the difference between the current measurement and the last which was not filtered, is larger than this value, the measurement will not be filtered.

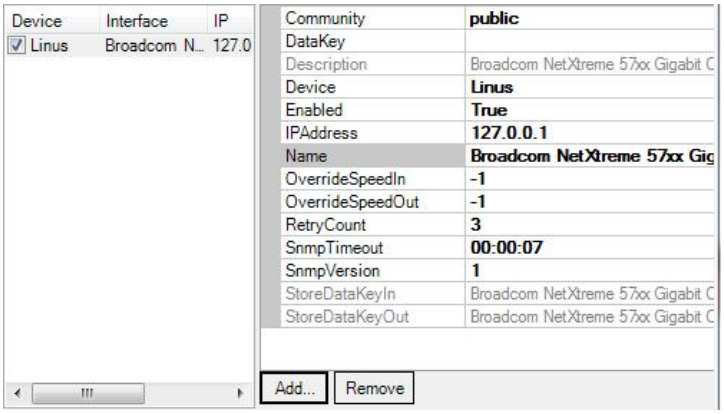
Interfaces

Add: adds a new bandwidth measurement. The next window appears:



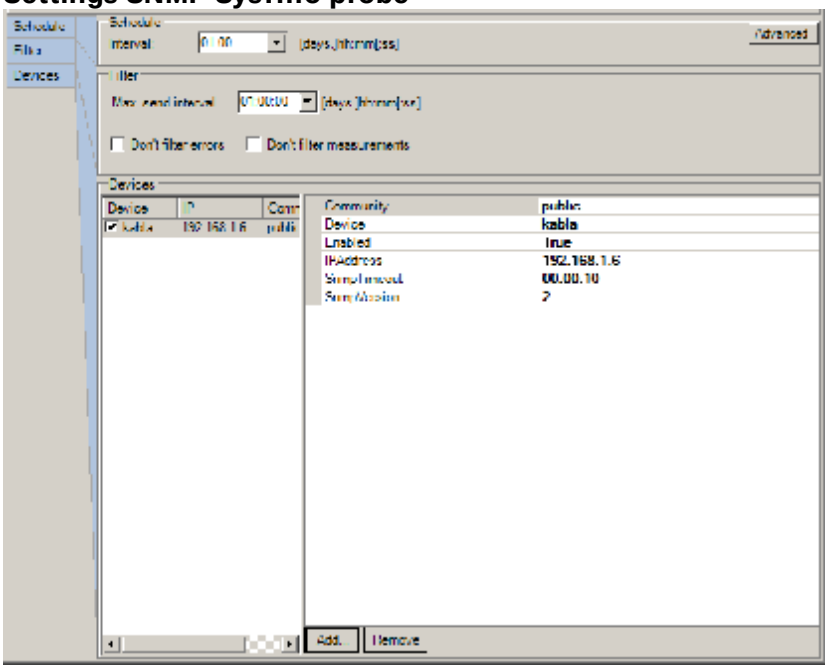
Name: name for the device that will be queried.
IP Address: the ip address of the device that will be queried. If no IP address is specified the name of the device will be used.

The bandwidth is measured by interface. Interfaces can be added by means of their number or name.



Enabled: Each device can be turned on or off separately.
Override SpeedIn: for specifying the fixed maximum graph value instead of the dynamically calculated maximum.
Override speed out: for specifying the fixed maximum graph value.
SnmpTimeout: Time which is waited for the SNMP query to be answered
SnmpVersion: The SNMP version to use.

Settings SNMP SysInfo probe

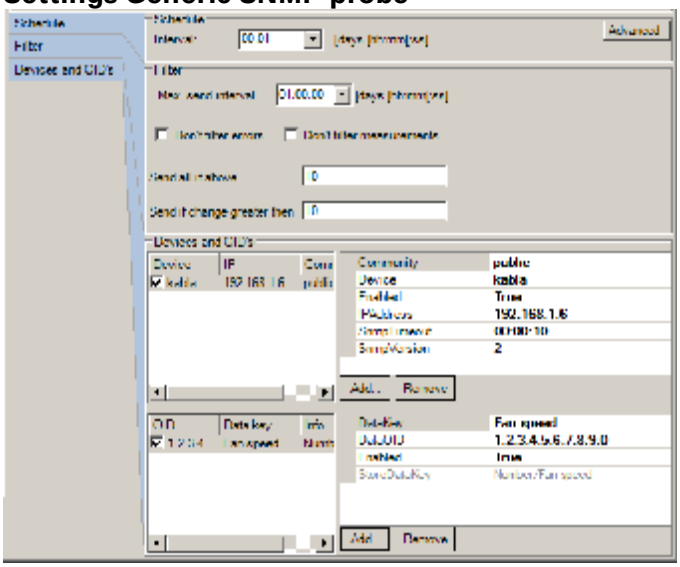


Schedule
Interval: the probe will measure with this frequency. The specified interval is the amount of time between the end of the last measurement and the start of a new measurement.

Filter
Max. Send interval: The maximum time whereupon a new measuring is always sent, independently of other filter settings.
Don't filter errors: the filter is not applied for errors.
Don't filter measurements: the filter is not applied on ordinary measurements.

Devices
Enabled: Each device can be turned on or off separately.
SnmpTimeout: Time which is waited for the SNMP query to be answered.
SnmpVersion: The SNMP version to use.

Settings Generic SNMP probe



Schedule
Interval: the probe will measure with this frequency. The specified interval is the amount of time between the end of the last measurement and the start of a new measurement.

The upper list shows the devices which must be measured. The bottom list shows the OID's. Each device is queried with each OID. OID can be queried to retrieve as number or as text.

Filter
Max. Send interval: The maximum time whereupon a new measuring is always sent, independently of other filter settings.
Don't filter errors: the filter is not applied for errors.
Don't filter measurements: the filter is not applied on ordinary measurements.

Devices and OID's
Enabled: Each device can be turned on or off separately.
SnmpTimeout: Time which is waited for the SNMP query to be answered.
SnmpVersion: The SNMP version to use.

7.14 External probe

Functional
The External probe is the interface to your own commands or scripts (or example probes you can find in the probe library on the EPO Elements forum).
The script must result into an EPO state, a number or a piece of text.

The EPO External probe can execute all type of scripts that can be executed on the windows machine. The only requirement for EPO to understand the result of the script is the way (a piece of) the output is written to the standard output:

Syntax for a piece of the standard output	**Example**
[EPO: Status]	[EPO: Status]
Datakey=*KEY*	Datakey=*BackupCheck*
Status=*STATUS*	Status=*Normal*
Timestamp= Date Time *(optionally)*	Timestamp=2007-01-15 08:00:00
[/EPO]	[/EPO]

Or

Syntax for a piece of the standard output	Example
[EPO: Number]	[EPO: Number]
Datakey= *KEY*	Datakey = *NumberOfFiles*
Number= *NUMBER*	Number = *5*
[/EPO]	[/EPO]

Or

Syntax for a piece of the standard output	Example
[EPO: Status]	[EPO: Status]
Datakey= *KEY*	Datakey = *FileExport*
Status = *STATE*	Status = *Warning*
Timestamp= date TIMe *(optionally)*	Timestamp= 2007-01-15 08:00: 00
[/EPO]	[/EPO]

NB Other states are: none (will result in white), unknown (blue), down (black), warning (yellow) and critical (red).

Or

Syntax for a piece of the standard output	Example
[EPO: Text]	[EPO: Text]
Datakey= *KEY*	Datakey= *backup-summary*
Status = *STATUS*	Status = *Critical*
Text += *TEKSTREGEL1*	Text += *backup unsuccessful*
Text += *TEKSTREGEL2*	Timestamp= 2007-01-15 08:00: 00
Timestamp= <date Time *(optionally)*>	[/EPO]
[/EPO]	

An external probe can opt to not send the result: just add a line with DontSend=true between [EPO: ...] and [/EPO]. This may be useful when there is nothing to report. Running an EPO external probe without any return value will otherwise result in the EPO state Unknown.

The “Text+=” row can be used as frequently as is necessary. The text appears in the EPO User client as a tool tip at the measurement (diamond) and in a separate tab called list.

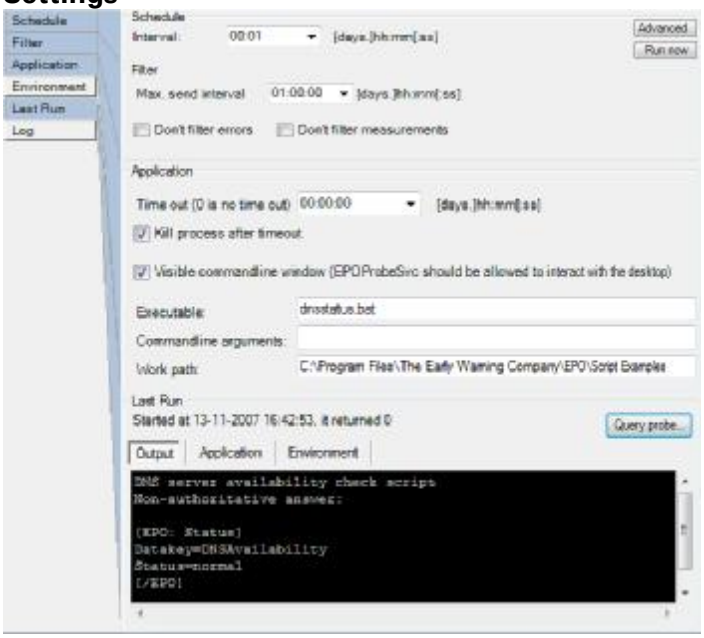
As an alternative for text output all text between two text blocks will be passed to EPO:
[Text]
Text which is passed to EPO
Another row
Etc...
[/Text]

Datakey (a user defined label) is the key under which the measurements are stored in the EPO database.

The state can contain of the following string values: Normal, Warning, Critical, Down, Unknown, None, Disabled or OutOfServiceWindow.

Without a specified timestamp the measurement gets the timestamp on the moment of the processing of the measurement. Optionally the timestamp can be given in the output of the script. The format of the Timestamp is: yyyy-mm-dd hh:nn:ss.

Settings



Schedule

Interval: the probe will measure with this frequency. The specified interval is the amount of time between the end of the last measurement and the start of a new measurement.

Filter

Max. Send interval: The maximum time whereupon a new measuring is always sent, independently of other filter settings.
Don't filter errors: the filter is not applied for errors.
Don't filter measurements: the filter is not applied on ordinary measurements.

Application

Timeout: How long is waited for the result of the external script.

Kill Process after timeout: if timeout occurs should the process be killed?

Visible commandline window: should the output of the script be visible in the commandline window on the machine where the script runs.

Executable: complete name (extention included) of the application
Commandline arguments: optional arguments
Work path: complete path to the executable

Example

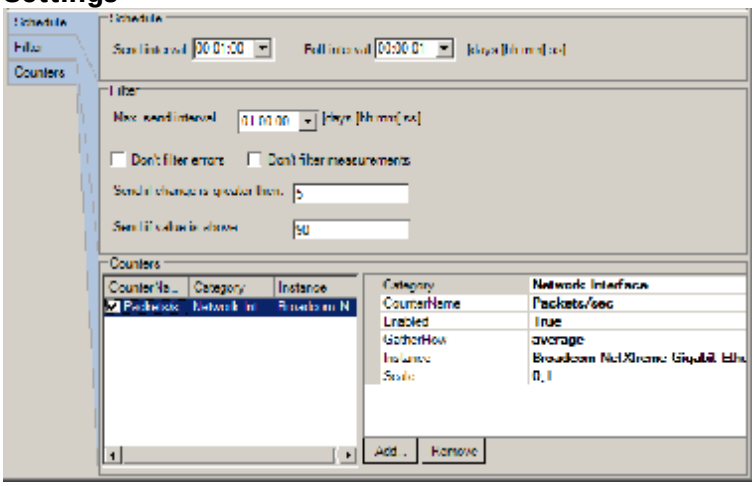
Look for script examples in the probe library on www.epo-elements.com.
Executable : cscript.exe
Commandline arguments : yourVBscript.vbs param1 param2
Work path : c:\programfiles\the early warning company\epo\scripts

7.15 Performance counters probe

Functional

With the performance counters probe is it possible to use the performance counters from the windows performance monitor (perfmon.exe).

Settings



Schedule

Send Interval: the probe will measure with this frequency. The specified interval is the amount of time between the end of the last measurement and the start of a new measurement.

Pol Interval: the probe will gather data with this frequency according the *GatherHow* property.

Filter

Max. Send interval: The maximum time whereupon a new measuring is always sent, independently of other filter settings.
Don't filter errors: the filter is not applied for errors.
Don't filter measurements: the filter is not applied on ordinary measurements.

Send all if above: If the value of the performance measuring comes above this value, the measurement is not filtered.
Send if change greater then: If the difference between the current measurement and the last which was not filtered, is larger than this value, the measurement will not be filtered.

Counters

Category: Performance counter category
Countername: Complete name of the performance counter. These must be entirely well spelled. Exact names of performance counters can be found using the perfmon tool (perfmon.exe).
Enabled: to switch measuring on and off.
GatherHow: Max/min: the largest or smallest number during the interval. Average: The average value measured during the interval.
Instance: performance counters instance name (not always present)
Scale: multiplying factor for the value of a measuring. The filter is applied afterwards.

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7.16 Virtual web user (Web probe)

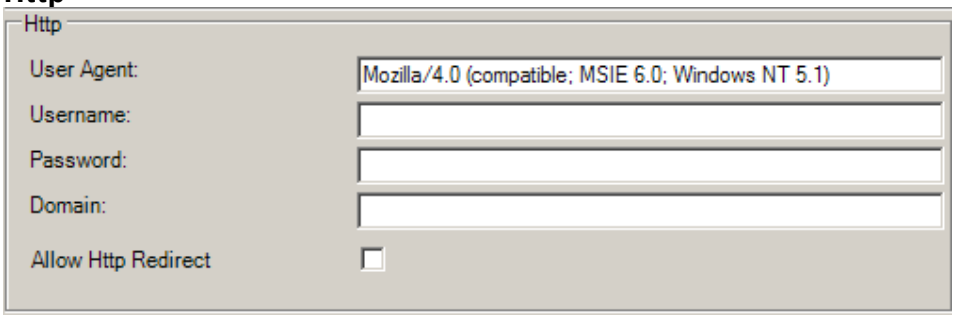
Functional

The virtual web user probe monitors the availability and the performance response of an internet site. It is possible to define a complete set of steps to simulate for example the complete action list of a virtual user for the monitored internet site.

Settings

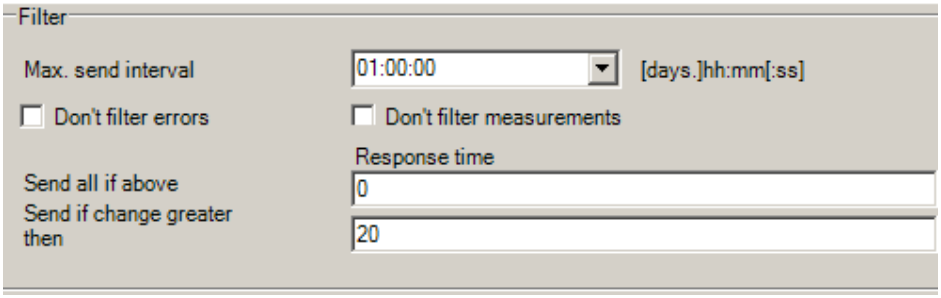
Interval: the probe will measure with this frequency. The specified interval is the amount of time between the end of the last measurement and the start of a new measurement.

Http



User agent: The probe identifies himself.
Username/Password/Domain: Possible http authorization (differently than by means of a form)
Allow Http Redirect: accept http redirect answers.

Filter



Filter

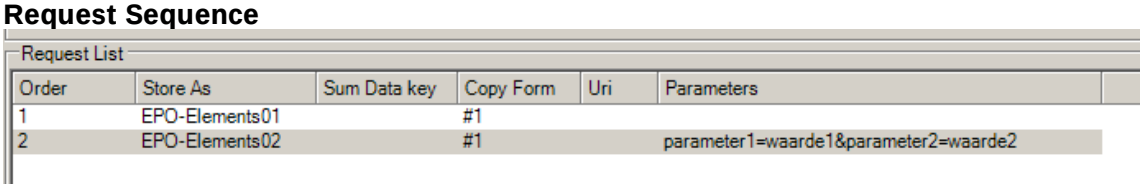
Max. Send interval: The maximum time whereupon a new measuring is always sent, independently of other filter settings.
Don't filter errors: the filter is not applied for errors.
Don't filter measurements: the filter is not applied on ordinary measurements.

Send all if above: As the response time is above this value, the measurements are filtered.
Send if change greater then: If the difference between the current measuring and the last which was not filtered, is larger than this value, the meeting will not be filtered.

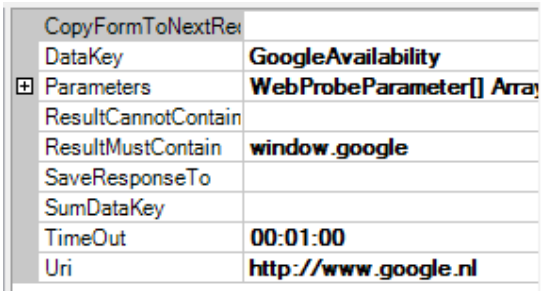
Proxy

Proxy server: Optional, name or IP of the proxyserver.
Proxy Username/Password/Domain: Possible authentication for the proxy server.

Request Sequence



This a list with HTTP requests for an Internet site. The requests will be executed in list order.



Copy form To Next Request: (optionally) the HTTP response (form data) of the request will be copied to the next request. The page number or the form name can be used.

DataKey: (optionally) name under which this result is stored.

Result Cannot Contain: (optionally) if this text occur the result of the request will be down.
Result Must Contain: (optionally) if this text doesn't occur the result of the request will be down.

Save Response To: (optionally) file name where the HTTP response is stored.
Sum data Key: (optionally) name for the added response times for all steps.
Timeout: (optionally) time which is waited for HTTP response.
Uri: (optional) address of the Internet site

Parameters

Each step can give a list of parameters. By means of this parameters the http-variables in the form data can be automatically filled in. This way it is possible to automate a virtual user performing the necessary steps to test complete the functional working of a web application.

Name: Name of the parameter
Value: Value of the parameter
Type: How the parameter must be given: as a POST variable or HTTP header, in COOKIE or in the URL.

7.17 Virtual Email User (Email probe)

7.17.1 General

The email probe can connect to an email server and send and receive email test messages. Doing this the availability and performance of the mail process can be measured and monitored.
This email probe is designed for Microsoft Exchange.

Installation

The email probe is automatically installed when the EPO probes are installed. It is part of the common probes.

Important:

- The probe service must log on as a user which has an exchange account.
- Outlook must be installed on the same device
- Outlook must be configured with the above mentioned account to send and receive email.

7.17.2 Accounts

To enable the email probe to send email through one account and to read email through an other account one of both accounts should be enabled as a shared mailbox. This is because outlook doesn't support the use of two accounts at the same time.
The mailboxes (accounts) have to be configured in that way that one account is used for reading mail and the other for sending.

Settings

Mail2Read: a list with mailboxes to read.
Mailbox: Postbus/map from wich to read the mail (default = inbox)
Mailer: Type of the mailserver.
Server: Address of the emailserver
SharedMailedBox: Name of the shared mailbox if that is used to read the mail (optional)
SourceID: Identifies the mail to collect. According settings in mail2Send.
UserAccount: Name of the mailbox/account.

Mail2Send:
Destination: List with emailaddresses to send mail to..
Mailer: Type of the mailserver.
Message: Subject of the email. Will be used by Mail2Read as SourceID. Optional, default=Devicename
Sender: Originator of the mail. Important if a shared mailbox is used.
Server: Address of the emailserver
SharedMailBox: if a shared mailbox is used for sending the mail specify the name here.
UserAccount: Name of the mailbox to connect to.

8 Reporting

EPO reports are defined in an EPO report file (erf). Such a report file contains a number of essential components:

- Data generators
- Data processors
- Data Result viewers

Data generators
The data generators ensure the delivery of the data from the EPO database. This can happen in a lot of different manners. For example measurement-data from the Business tree or data from the database firebird query or sql query. The produced data is always delivered as a xml-file.

Data processors
The processors process the data supplied by the generators to the desired document. Thus for example the data can be converted with a XSL processor to html, XSL-FO or CSV. A XSL-FO file itself can be transposed by means of a pdf processor to a pdf document.

Data Result viewers
When all previous steps successfully have been carried out and a html or pdf file has been produced, the result can be reflected in a result viewer. At the moment we use a web browser because it can reflect several file formats. If it is not necessary to show a report then no result viewer has to be defined.

ERF is XML
An erf file is actually a xml-document describing (in XML definitions) the way a report is build. Such a erf is build as follows:

```
<?xml version="1.0" encoding="utf-8" ?>
<report type="EPO.Interfaces-Report">
<DataGenerators></DataGenerators>
<DataProcessors></DataProcessors>
<DataResultViewers></DataResultViewers>
<LeaveTempDirectory></LeaveTempDirectory>
<TempDirectoryName></TempDirectoryName>
<GeneratedDataFile></GeneratedDataFile>
</report>
```

<LeaveTempDirectory></LeaveTempDirectory>
This value ascertains whether the temporary directory, which is used to store temporary files must continue to stand after successful generating the report, or have to be deleted. During the developing of a new report it is useful to set this property on true, so that the generated temporary data.xml can be investigated. After successful delivery of the the report this value can be set to false, so that only the report remains and all temporary files are removed.

<TempDirectoryName></TempDirectoryName>
Here the temporary directory is set. When for example a pdf file is made a xsl-fo temporary file is necessary, which is actually the source code of the pdf. This file is placed in the temporary map, and can after successful making the report it is removed.

This property is optional and is set default to the temp-directory of the pc. The report definition can also handle parameters. These are noted as $(nameparam1), $(nameparam2) etc.

EPO reports
EPO is provided with a few example reports which are installed on the server during the installation of EPO Elements 5.0. These reports become available in the client. With some knowledge of xml, xsl and xsl-fo (all standards itself) these reports can be adapted.

To make EPO reports
Start with adapting a working example report. A nice small example is the generating of a csv file (downloadable from the tools&add-on section on www.epo-elements.com (after logging in)).

Commandline option
EPOGui.exe ActionFile “C:\Mijn EPO Rapporten\Example CSV\report.action”.
In this action file the erf-file is linked and the reportparameters (if present) are specified.

Advanced Report options
On the EPO elements forum we will discuss in the run to the next version of EPO advanced ways of using reports. Such as: parameter passing, batched reports, realtime graphs for linking into a live internet page and linking reports to the menu of the EPO GUI.

9 EPO-Procedures

In this chapter regular used EPO-functionality is described.

9.1 How do I add a new server for remote monitoring?

Step	Description	Implementation	Result
1	Install the Windows probe on the server to monitor	See § 3.5, "Installation", page 16.	- installed probe - working probe - measurements come to EPO-database
2	Add the new device to the Business Tree	- In EPO business client: edit business tree	- basic information of the windows robe is viewable and will me monitored according the (default) threshold values.

9.2 How do I add a new router bandwidth monitor?

Step	Description	Implementation	Result
1	Consider from which device the router will be monitored		
2	If not yet present install the EPO probes	See § 3.5, "Installation", page 16.	Installed probe
3	Activate the EPO snmp probe	See § 7.1, "To add new probes", page 35.	Activated snmp bandwidth probe
4	Configure the probe	See §7.13, "SNMP probes", page 44.	Working bandwidth measuring.
5	Add the new test information to the Business tree.	- In EPO business client: edit business tree. - look at probed object	Information is shown in EPO business tree

9.3 How to adjust threshold values?

Step	Description	Implementation	Result
1	Modify the properties of a node in the Business tree	- select the node in the Business tree - right mouse button for edit this node - modify the desired property - save (and wait some moments) NB Modified thresholds will be used immediately but to see adapted thresholdlines you have to reselect the node.	Thresholds have been adapted.

9.4 How do I monitor the availability of my IP-components?

Step	Description	Implementation	Result
1	Consider from where the router will be pinged		
2	If not yet present install the EPO probes on the machine	See § 3.5, "Installation",	Installed probe

	from which the monitoring will take place	page 16.	
3	Activate the EPO (ICMP) ping probe	See § 7.1, "To add new probes", page 35.	Activated probe
4	Configure the probe	See § 7.11, "ICMP (ping) probe", page 41.	Working bandwidth measuring.
5	Add the new test information to the Business tree.	- In EPO business client: edit business tree. - look at probed object	Information is shown in EPO business tree

9.5 How can I add my own script to the EPO monitor?

Step	Description	Implementation	Result
1	Adapt your script for sending the desired result (a status, a number or a piece of text.) to the standard output.	See § 7.14 ,"External probe", page 47 for the output syntax.	EPO will understand the output and use it as an interface between your script and EPO.
2	Consider from where your script will be carried out		
3	If not yet present install the EPO probes	See § 3.5, "Installation", page 16.	Installed probe
4	Activate the EPO external probe	See § 7.1, "To add new probes", page 35.	Activated probe
5	Configure the external probe	See § 7.14, "External probe", page 47.	Script is carried out on the specified interval.
6	Add the new test information to the Business tree.	- In EPO business client: edit business tree. - look at probed object (External)	Information is shown in EPO business tree

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10 EPO Configuration

10.1 Thresholds

10.1.1 Default thresholds

To change the default thresholds edit the file …\epo\server\TreeExtenders.module. Remember to make a backup of this file first!
New settings will only be applied for newly dragged-and-dropped devices to the Business tree.
Example: to change the default critical threshold for a CPU (95%) look for the item <Name>CPU.Critical</Name> and change the specified threshold to your own desired value. Restart the service EPO Server (net start/stop eposerversvc) to apply the changes you've made.

10.1.2 Scale of the graph

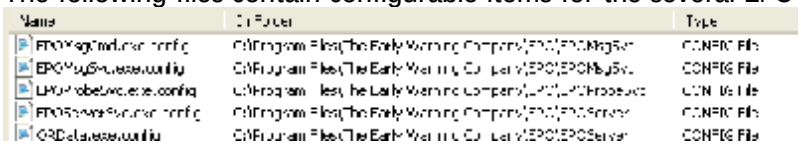
The scale of the graph is adapted automatically to be able reflect the highest value. It goes there at for:

- the measurements
- the threshold values

NB. When the threshold values differ a factor hundred or more from the measurements, then the measurements are not or hardly visible in the graph.

10.2 Configuration files

The following files contain configurable items for the several EPO components:



NB. The configuration files have the name (+.config) of the service or executable where they belong to.

10.3 Data storage

In the file EPOServerSvc.exe.config in the server directory the StorageType can be modified from Binary to Xml:

```
<plugins>
        <PluginFactories>
            <item type= EPO.Plugin.SettingsManager >
                <SettingsPath>. \ Data \ SettingsManager</SettingsPath>
            </item>
            <item type= ePO.Interfaces MeasurementStoreFactories >
                <StoreFactories>
                    <item type= ePO.Plugin.Measurements RawMeasurementStoreFactory >
                        <BasePath>. \ Data \ ProbeData</BasePath>
                        <Extention>edf</Extention>
                        <StorageType>Binary</StorageType>
                    </item>
```

```
                    <item type= ePO.Plugin.Measurements TransformMeasurementStoreFactory >
                    </item>
                    <item type= ePO.Plugin.Measurements CombiningMeasurementStoreFactory >
                    </item>
                </StoreFactories>
            </item>
            <item type= ePO.Plugin.Measurements RawMeasurementMessageReceiver >
            </item>
            <item type= EPO.Plugin.EPointManager >
            </item>
            <item type= EPO.Plugin.StatusTreeHost >
            </item>
        </PluginFactories>
    </plugins>
```

10.4 Memory usage

EPO has been developed default to:

- use a a large part of the usable memory
- release it if another application asks for it.

Underlying idea: resources are there to be used.

10.5 Probes by means of WAN, Internet by means of WAN, Internet

EPO-probes (and therefore connections) can be defined concerning:

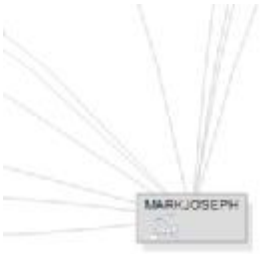
- VPN
- Internet
- ipforwarding
- Proxy firewall

10.5.1 To establish EPO network for not automatically detected machines.

EPO systems find each other automatically only within the same subnet/segment. If 2 EPO remote networks (minimum 1 probed machine on each side) have to be connected to each other:

Start from the client which has one part of the network visible, the configuration editor (Edit->Edit probe Configuration)

Click with the right mouse button somewhere in the white part and choose Add new device…



Name is exactly the name which supplied to the device during the installation of the EPO Probe (default the . If at DNS name nothing is specified the name field will be used also as DNS name.

If "MachineVerWeg" is given as a Name then the result will be:

Click afterwards with the right mouse button on MachineVerWeg and drag a connection line to the EPO-Server. The following window appears:

The source port needs only be filled in if it is different than the destination port.

The IP address or the resolvable name of the new device can be supplied as *destination*.
The *protocol* determines if the data concerning this connection must be send encoded binary, ASCII or UTF-8.
The *Cost* gives a virtual value to the connection. The chosen route is stipulated by the lowest total costs.
Enabled: If not checked these route is not used also if it is available.
Available: The route is available or not

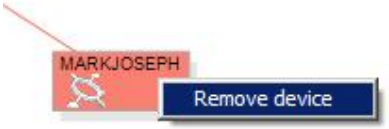
If is pressed on OK a connection line between both machines will appear after a few seconds (a red line indicates that there is no (or not yet a) connection..

The same have to be applied the other way around. Then the next situation arises and the connection is complete.

The remaining probed machines on the remote network at MachineVerWeg will also appear after some seconds.

10.5.2 To remove Devices

With the right mouse button on a device it can be removed.
THE EPO server where the EPO-Client is linked (dark grey) cannot be removed.



10.5.3 Connection test

To test the existence of a connection:

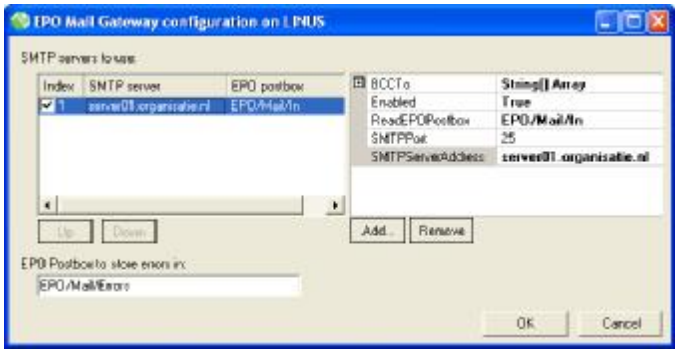
- **Network connection (tcp/ip)**:
  Test this from within the EPO Server itself as well from the probed machine
  telnet <ipadres> 7472
  expect result: emptied command screen (=OK)
- **EPO Connection (EPO transport layer on top of tcp/ip):**
  on the EPO-Server: epomsgcmd info or epomsgcmd roundtriptest <device>
  start on the probe side: “epomsgcmd - s ipadres_van_de_server: 7472 list”
  expected result: a list of Postboxes with numbers of messages for the specified devices.

10.6 EPO Mail gateway

The EPO mail gateway makes it possible to send an e-mail from the escalation manager by offering the e-mail to your mail server.

The epo mail gateway must be installed on the EPO server itself.
To configure choose menu “Edit \ Edit probe configuration“...

Choose the yellow (most right) icon for the mail gateway configuration:



The selected SMTP-server should be configured to relay mail for the epo server.

11 EPO Maintenance

11.1 Maintenance, backup and restore of the database

11.1.1 EPO database

The EPO data exist from two separated kept data collections:

1) **the measurements (probe results)**
   the measurements are kept in a so-called flat file database. Exhaustive testing has shown that this determines little difference for the performance, but that simple administration of the data strongly increases as a result. The following directory order under "... \ EPO \ EPOServer \" data is apprehended:
   - per month a separate directory (yyyy-mm)
   - below by probe a separate directory (DK_EPO_K<probe name>)
   - possibly below by sub-directory the different probe information components
   - below per day the information in a separate file.

   Double click on an edf-file will start the data viewer (the same data viewer that can be invoked from within the EPO Gui by right clicking a data node in the Business Tree and selecting "View Measurements").
2) **the tree definition, screen definitions**
   this data is kept in an sql-based database:
   (default) c:\program files\the early warning company\epo\data\epo.fdb

11.1.2 Backup

It is easy to make a backup of EPO: just make a copy of the complete EPO directory. Use a tape or other backup device.
The EPO data files (EDF) can be copied during normal operation (no read locks).

11.1.3 Restore

Just place the files from the backup device to their original destination.

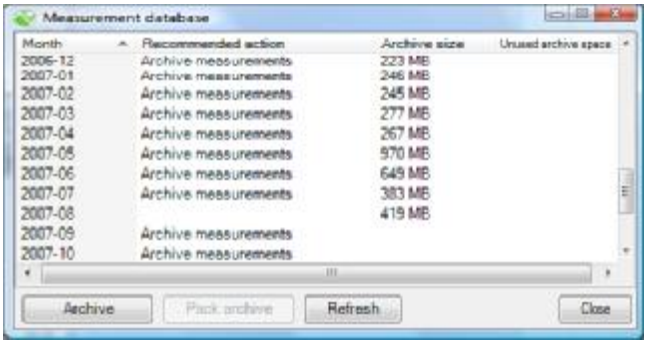
11.1.4 Disaster recovery

To recover after a clean windows installation:

- Run the standard setup with the same components and specified installation path as the original installation.
  EXCEPT: DON'T START the services (last option of the third installation step – See § 3.5 section 3)
- Just place the files from the backup device to their original destination
- Start the epo services

11.1.5 Compress measurement database

The EPO measurements files can be compressed. Choose menu Administration \ Measurement database. Choose an archivable month and select the Archive-button. As a result the many files are compressed to one remeaning file in the probedata directory with extension eda (Epo Data Archive).



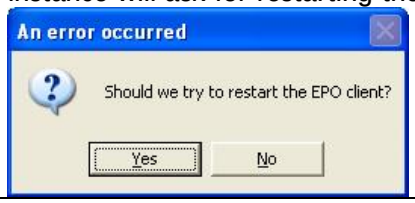
11.2 Problem solution

In this paragraph a number of possible solutions has been incorporated for well-known error states.

NB on EPO-Forum the <www.epo-forum>http://www.epo-forum/ stand the most recent versions of *FAQ-list* and *known issues*.

1. the EPO Client gives the Error message "No connection..." at start	
Situation	 EPO-Client can get no contact with EPO-Server, possible causes to be: 1. On EPO-Server the service EPO server is not started. 2. Network has been broken between EPO-Client and EPO-Server. 3. Firewalls prevent network contact between EPO-Client and EPO-Server 4. EPO-Client and EPO-Server are not in the same LAN-netwerk.
Possible solutions	1. Start the EPO server - service on the EPO-Server 2. Research the network connection. For example by ping EPO-server (ping.exe or tracert.exe) 3. Firewalls generally permit (default) within local network (LAN) all communication. The firewall should permit EPO communication for port 7472.

2. The Windows task manager indicates that the EPO Client is started twice	
Situation	As the EPO-Client is started there are 2 processes (EPOGui.exe) visible in the Windows task manager:

Explanation	This is a normal situation. EPOGui.exe is started twice for standard. The first instance of the process EPOGui.exe is the actual client. The second instance only monitors the database connection and the active state of the first instance. If the first instance indicates an error state the second instance will ask for restarting the (first) client: 

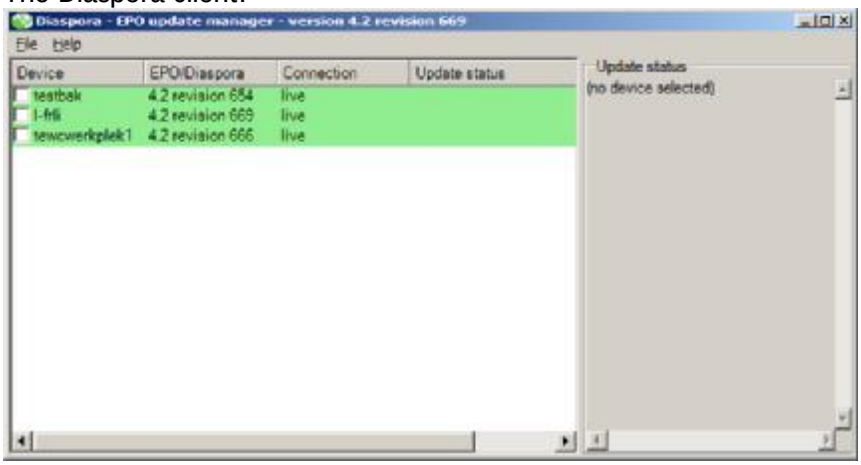
3. There comes no information (anymore) from the Windows probe	
Situation	1. Node remains blue (=unknown) in the EPO business tree 2. Node turns into blue after another status. 3. the newly added probe does not become visible in “edit tree “ under probed object.
Possible cause	Measurements are not received by the EPO-server. Possible causes: 1) the epo probe cannot link (temporarily) with the EPO-server 2) the network connection has been not yet permitted 3) if it is an remote probe the new device is not yet added to EPO
Solution directions	1) Research the tcp network connection from the probed machine: telnet eposerver 7472 **à** clear screen = OK 2) Research EPO-connection with: epomsgcmd info or epomsgcmd - s <eposerver> roundtriptest <ip or name probed machine> 3) In case of missing device: Add the new device See § 10.5, “Probes by means of WAN, Internet by means of WAN, Internet”, page 59.

12 Diaspora

EPO has the possibility of updating itself by means of the software delivery tool “Diaspora”. Diaspora exists from 2 parts, a part that resides on the server side and a client part.

Diaspora sends the updates by means of the EPO transport layer.

The Diaspora client:



All probed machines (not the epo clients) are shown where the diaspora service is installed. By means of “File->Send Update” a .diaspora file can be selected. Such a file has the following options:

```
[Transfer]
DontUpdateSelf=true

[Execute]
Application=DoDiasporaUpdate.cmd

[Files]
Add=EPO-669 \ DoDiasporaUpdate.cmd
Add=EPO-669 \ EPO element 4.2-669 Setup.exe
AddMatch=EPO-669 \ NetworkKey.ekf
AddMatch=EPO-669 \ InstallOptions.ini
```

[Transfer]: certain options as DontUpdateSelf with which can be indicated if diaspora itself can be updated.
[Execute]: Applications which must be activated after the file transfer.
[Files]: The files which must be sent.
Add: The file with that exact name.
AddMatch: Adds the files with matching Wildcards as * and ?.

The update will be sent to all selected machines. As the update it is carried out the result of the implemented program will be given as feedback.

13 Frequently Asked Questions with the Answers

See www.epo-elements.nl for the last version.

Handbook EPO Elements

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